Japan Illustrated

The Japan Times
QUARTERLY MAGAZINE

HOKKAIDO: japan's land of promise

YEAR-END AND NEW YEAR IN TOKYO

1968·VOL.6·NO.1





Only after a test run will you see the truth of this Ad.

From the outside the look of the Colt 1100 is handsome.
Classically so with roomy interior and real road economy.
You'll have smooth cruising thanks to the quiet 1,088 cu. cm. (66 cu. in.) 58HP engine and 4-speed full synchromesh gearbox. Power is smoothly transferred into actual performance.
Cornering is flat and low, parking is simple (ladies love this feature).
It comes with self-adjusting brakes,
padded glare-free dash, child-proof door locks,
brilliantly flashing turn signals
and lots more . . . a great deal more
than in any other economy compact.
Take it out for a test drive
with your family and friends.
Then you will realize that this ad was right.

COLT 1100

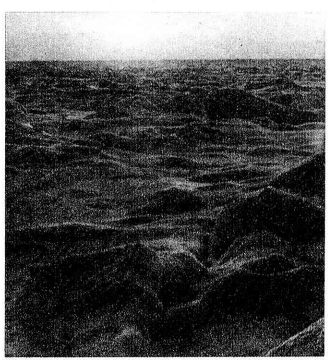
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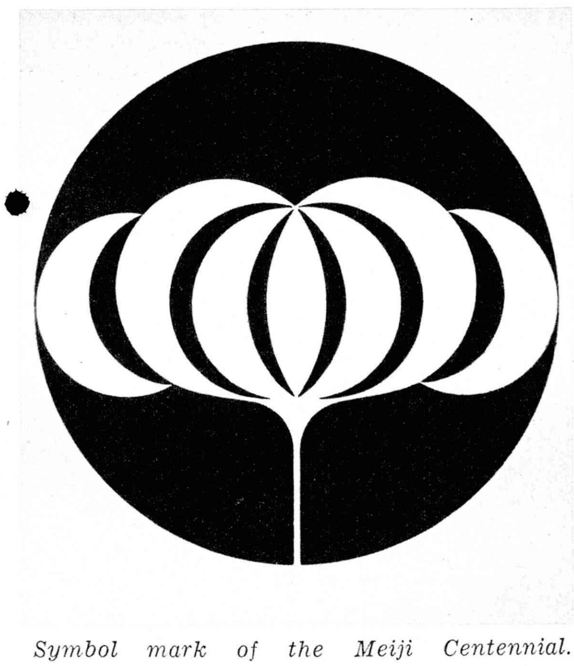
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Japanese Currents

NATIONAL NEWS

Symbol Mark of the Centennial of Meiji Restoration

The 100th anniversary of the Meiji Restoration falls this year. Exactly a century ago in 1868, Japan took the first major stride on the road of modernization. A transfer of political power from the Tokugawa Shogunate to the Emperor gave birth to a new Government. Edo was renamed Tokyo (literally, eastern capital), while the name of era was changed to Meiji. The new Government abolished the national isolation policy of the Tokugawa Shogunate, opening the doors of the country to the world, and applied itself with vigor to the task of establishing parliamentary politics, fostering modern industry and assimilating Western culture. This was the so-called Meiji Restoration.



Symbol mark of the Meiji Centennial.

To commemorate the centennial of this great national revolution, a series of colorful, gala program will take place this year, including the Government-sponsored events and ceremonies. And an emblem representing a simplified figure of a chrysanthemum has been adopted as the "symbol mark" to be used for these commemorative programs and centennial posters. Mr. Tadashi Ohashi, 51, the designer of the mark, explained: "The centennial ceremonies for the Meiji Restoration will take place on October 23—that is, when the chrysanthemum is in full bloom. That's why I have chosen this flower as the motif of the symbol. The curved lines formed by petals extending to the right and left are intended as symbolize not only a century of progress Japan has made since the Meiji Era, but also the further advance of the country into the future."

The Government has expressed hope that the mark will be used not merely on commemorative posters, but by department stores and other commercial establishments in whatever colors they please. Therefore, this chrysanthemum flower mark will be much in evidence in all parts of the country this year along with the cherry blossom symbol of the Japan World Exposition in Osaka in 1970 and the snowflake of the Winter Olympics to be held in Sapporo.

COMMUNICATION

"TV Telephone" Commercialized

A video-phone system which makes it possible to speak on the telephone while watching the other party's facial expressions on television has been placed on the market. The manufacturer, Nippon Electric Co., claims this is the first commercial model of its kind in the world.

The video-phone system consists of a television camera, receiver (picture tube) and transmitter, plus a telephone exchange equipment. When you push one of the buttons on the telephone set to call the other party, and the other picks up the receiver, the TV screen on each end shows the other's face. Designed for the chief purpose of communication among the top management of a company, a system with 20 circuits costs about ¥9 million.



The black circle above the TV screen is the "eye" of the TV camera.

The maker is confident of sales, because "it helps modernize business management," a spokesman said, "by enabling company executives to exchange views and give instructions without leaving their offices." "This should prove a valuable aid in this busy age," he added. As for other purpose, the system is said to be useful in remote supervision of construction work, display of commodities at department stores and improving services at banks and other places. "Orders are pouring in," the spokesman said.

Competitors are expected to follow up the NEC product with their own versions of TV telephones, which were once regarded as something for the distant future but have now become a reality.

Pocket Bell Age Here



A "pocket bell" set. Some may say things are getting too convenient.

"Pocket bell" telephone service will become available in Tokyo starting next June, enabling suspicious housewives to track down their wandering husbands.

The idea is to contact someone away from home or office by ringing a bell in his pocket and having him call his home or office from the nearest telephone booth.

The pocket bell set is slightly larger than a pack of cigarettes, with a length of 12 centimeters, a width of 6 centimeters and a thick-

ness of 2 centimeters, and weighing 100 grams. The set fits snugly in the shirt pocket.

To ring a bell, one dials 290 followed by a four-digit number given each set. When the bell rings, the owner rushes to the nearest phone and calls his home or office, or any other predetermined place. The bell rings intermittently for one minute. The set cannot be used as an ordinary telephone. Signals can be received in a concrete building but not in the basement or when one is riding a subway train. The battery powering the bell set lasts 10 hours when used continuously, and is rechargeable.

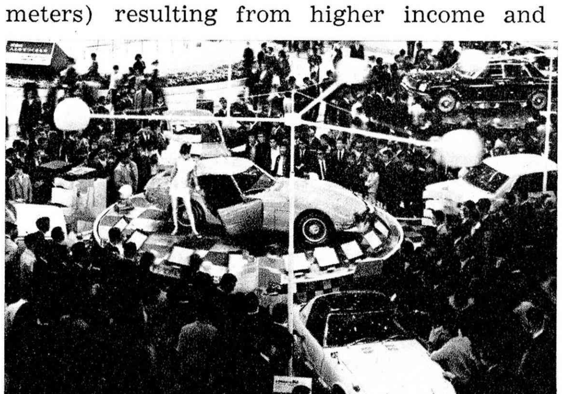
Depending on the reaction of subscribers, the Japan Telegraph and Telephone Corporation may extend the service to Osaka, Nagoya and other major cities. The new service is expected to prove a great boon to doctors, newsmen, salesmen and the like, but may come as a threat to wayward husbands.

INDUSTRY

Japan Ranked Second in Auto Output

According to estimates of the Japan Automobile Industrial Association, the country in 1967 produced 3,140,000 units of automotive vehicles, vastly improving the 1966 record of 2,280,000 units. Thus, Japan surpassed West Germany and became the world's second largest auto producing nation, behind the United States.

The enormous boost in Japan's auto output has been supported for the most part by zooming sales of so-called family cars (with a piston displacement around 1,000 cubic centimeters) resulting from higher income and greater purchasing power for the general public.



The 14th Tokyo Auto Show, which attracted more than 100,000 visitors every day.

The history of motorization in Europe shows that demand for passenger cars goes up all of a sudden as their unit price comes down to around 140 per cent of the per capita national income of a country. In Japan today, typical family cars—e.g. the Toyota Corolla, Datsun 1000 and Mitsubishi Colt—are priced in the range of ¥400,000 to ¥450,000, which is just about equal to 1.4 times Japan's per capita national income. This means that Japan will soon experience an explosive popularization of economical cars.

This prediction is backed up by the fact that approximately half of the estimated 23 million holders of driver's licenses do not yet own a car but hope to become an owner someday. Hence, it seems certain that demand for cars and auto production in Japan will continue to rise this year and for sometime after that.

Nevertheless, Japanese auto makers today are faced with a serious threat from the imminent liberalization of direct foreign investments in this country and with the need to reorganize the industry to meet this challenge. The surging tide of realignment has already engulfed part of the industry. Nissan Motor Co. has absorbed Prince Motors Co., while Toyota Motor Co. has made arrangements for business tieups with Hino Motors and Daihatsu Kogyo Co.

Experts predict that the Japanese automotive industry will eventually have to be reorganized into three groups if it hopes to meet the stiff international competition to be offered by giant Western enterprises. Two of the three groups are already obvious—Toyota and Nissan. Who will become the leader of the third group is anyone's guess, for it depends on adroit maneuverings by Mitsubishi Heavy Industries and Toyo Kogyo Co., which are ranked behind the Big Two, Toyota and Nissan.

Speculations on this third group, together with announcements on new models, are sure to provide mass media with headline material for the coming year.

Super-Size Tire

Giant tires with an outer diameter of 2,530 millimeters, width of 640 millimeters and weighing one ton each are being produced at the Kodaira Works of the Bridgestone Tire Co. The enormous tires, the largest ever to be made in Japan, are priced at ¥1,818,450 each—enough money to buy three regular cars.

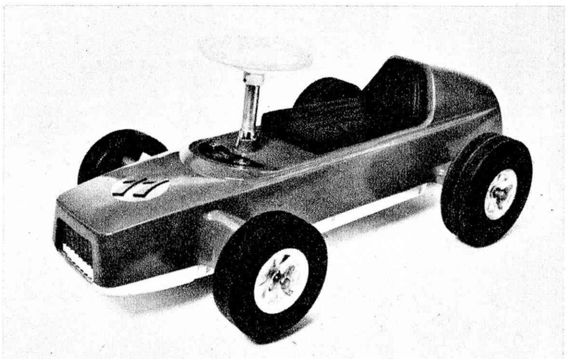
They will be used on 100-ton dump trucks, not in Japan but in the United States and Canada, where there is enough space for such large-size trucks to drive around.



This is too big to be used in Japan.

TOY

Toys That Make Grownups Envy Children



The "Echo Racer" has proved a big hit.

Reflecting the motorization fever sweeping the nation, toy cars seem to be an overwhelming favorite with Japanese children today. Especially popular are powered toy cars that they can ride in, and that make grownups envy the little ones.

One of the best sellers in this category is the "Echo Racer" offered by Kodama Chemi-

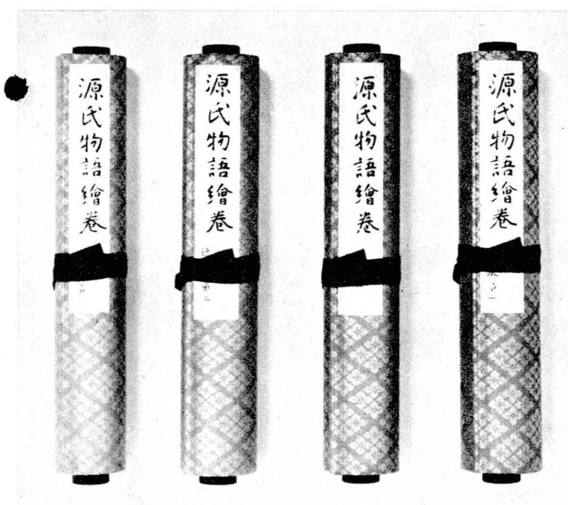
cal Industry Co. With a formula car styling, it is one-meter long and weighs 11 kilograms. The plastic-bodied car is powered by a 12-V battery, which lasts four hours when used continuously and can be recharged from an ordinary wall socket.

Carrying a passenger weighing 30 kilograms, the Echo Racer develops a speed of 2.7 kilometers per hour. It can back and is equipped with a device to prevent overheating. It sells for ¥16,800. The manufacturer says it is produced at a monthly rate of 15,000 units and part of the production finds its way abroad.

PUBLICATION

Reproduction of Genji Monogatari Picture Scroll Published

A complete reproduction of the Genji Monogatari Picture Scroll, depicting the gorgeous court life of ancient Japan, has been published by Kodansha Publishers Co. of Tokyo. The original picture scroll, designated as a national treasure, is a product of the first



A reproduced Genji Monogatari Picture Scroll preserves 700-year-old beauty.

half of the 12th century and is based on the first great Japanese novel written in the 10th century by Lady Murasaki Shikibu and world-famous through translations.

Known as the greatest masterpiece of Japanese picture scrolls, the Genji scroll features tasteful composition combined with exquisite harmony of color, calligraphy and paper quality.

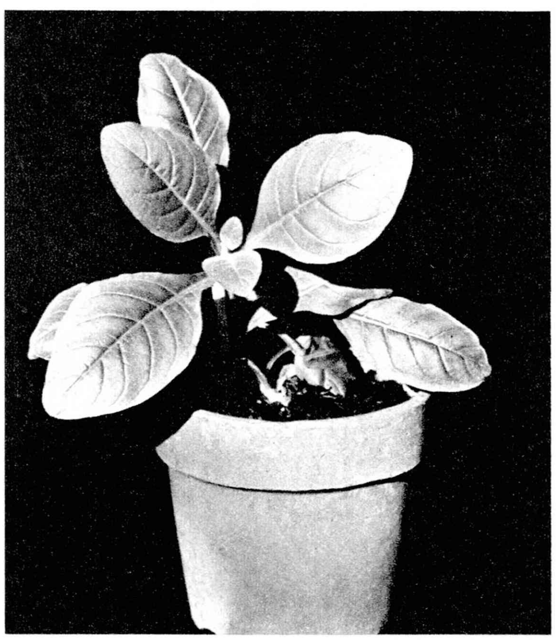
In the recent reproduction project, the four original volumes preserved separately at the Tokugawa Art and Goto Art Museums, were brought together for exact reproduction using the highest printing technique and best paper available. The product, also in four volumes, comes in a luxuriously varnished box, which in turn is placed in a plain paulownia box. More an art object than a publication, a set of four volumes sells for ¥158,000—far above the prices asked in the current rush of artistic publications.

At any rate, the project has been acclaimed as a worthwhile one in that it perfectly reproduces and preserves a valuable art heritage of Japan, dating back 700 years.

SCIENCE

Plant Produced Without Pollination

Producing a plant artificially without pollination has long been a dream of world botanists and has now come true in Japan. At the Hatano Experiment Station of Japan Monopoly Corporation, botanists recently developed from tobacco pollen a perfect tobacco plant with normal leaves and roots.



A tobacco plant produced without pollination.

In this experiment, offspring was obtained without pollination. In the animal kingdom, this would be equal to childbirth without insemination. The major breakthrough has drawn worldwide attention as an epoch-making contribution to genetics and plant breeding.

Japanese Currents

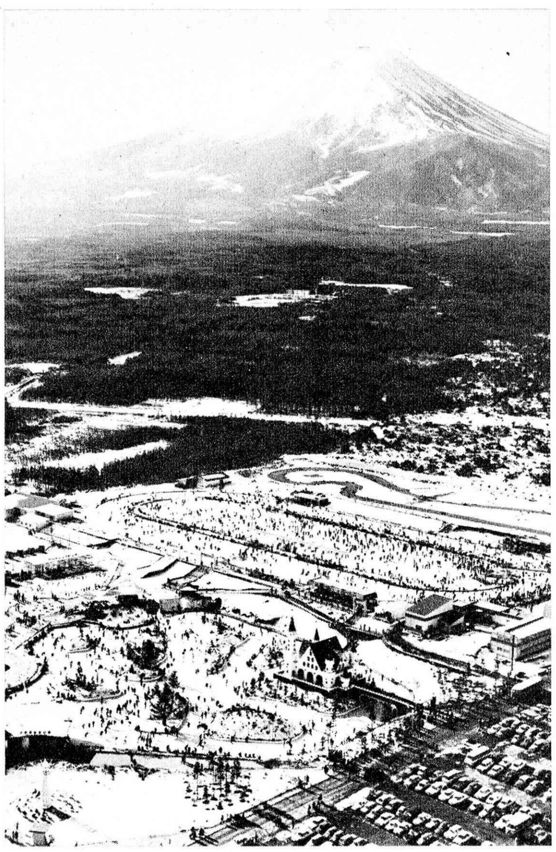
A product of pollen alone inherits only the male genes, i.e. the male factors that determine hereditary characters. Consequently, it is easier with such a product, than with ordinary products of fertilization, to control and improve breeds.

By this process, Japan Monopoly Corporation experts say, it takes only two years to develop the desired hereditary characters in tobacoo plants, whereas by conventional crossbreeding one must wait at least six years to achieve the desired results.

LEISURE

World's Largest Artificial Rink

Winter sports enthusiasts are increasing annually in Japan, triggering a rush for larger and more luxurious skiing and skating facilities.



The mammoth rink at the foot of Mt. Fuji.

One of the recent additions to the growing number of skating rinks in the Tokyo area is the "Promenade Rink" opened in the Fujikyu Highland skating center which can be reached in three hours' train ride from the capital. Claimed to be "the ultimate" in de luxe rinks, the new day-and-night skating center is attracting hordes of skaters on weekends.

The Promenade Rink, built by Fuji Kyuko Co. (an electric railway company) at a cost of ¥340 million, is a piping rink covering an area of 4,960 square meters. Brightly illuminated at night, the circular rink is designed in promenade fashion surrounding a rest house which gives an impression of a fairyland castle set against the background of Mt. Fuji.

Besides this, the Fujikyu Highland has a speed course with a 400 meter circumference and a figure-skating rink. The combined area covers 15,400 square meters, which makes the center the largest artificial rink in the world.

Bowling Fad

When asked what American product has made a worldwide hit in recent years, one invariably mentions Coca Cola. In Japan, however, bowling has lately become the veritable rage, and the bowling population is said to have already run into millions. In fact, the bowling fad is spreading fast from urban to rural areas and from young people to middle-aged generations. According to a recent survey, Japan's bowling facilities have reached 10,000 lanes or next only to those of the United States, the home of bowling, finally surpassing the 9,000 lanes of Canada.

The "pin and bowl play," ingeniously combining an element of game for pastime and an element of sport, first caught on among university students in Japan. It then spread to white-collar workers. Soon women started to appear at bowling alleys in the company of boy friends, and now, even housewives take time out to enjoy bowling. In addition, more than 20 universities have adopted bowling as a full athletic course. Meanwhile, bowling techniques have made marvelous progress, resulting in the birth of professional bowlers qualified to compete in international championships.

The remarkable bowling fad must after all be ascribed to the fact that it can be enjoyed "easily." Most Japanese bowling alleys are conveniently located in shopping centers or in the neighborhood of residential areas. So people can drop in on their way home from office or between household chores. The



Always crowded bowling alley in Tokyo.

game of rolling the bowl to topple pins is simple and easy to remember. People can enjoy bowling irrespective of age and physical strength. And neither rigorous practice nor high techniques are required if it is just for enjoyment. For teenagers, bowling alleys also apparently serve as a sort of place for social intercourse because of their gay, relaxed atmosphere.

FASHION

Japan Turns Importer of Silk

Japan has long been known as the world's top producer and exporter of raw silk. But today the country has become an importer. The reason: the fantastic popularity of kimono among young women.

For a time after World War II it seemed as though expensive silk kimono had been completely abandoned by the war-ravaged nation. But as economic recovery and development made progress and pushed up national income, the Japanese rediscovered the unique beauty of their traditional costume.

The revival of kimono wearing among young women gained momentum with the recent business boom, which made them richer and to seek more and more expensive goods. Such is the fad that girls in Western-style dresses would find themselves a black sheep among the blossom of their kimono-clad sisters at college graduation ceremonies and the like.

As a result, domestic silk suppliers could hardly keep up with the booming demand and were forced to import from neighboring Asian nations. Thus, Japanese imports of raw silk and silk fabrics soared above exports of these items. According to the Ministry of Agriculture and Forestry, the price spiral in Japanese silk is inducing higher quotations in India, China, Korea and even in the Soviet Union.

Year-End And New Year In Tokyo

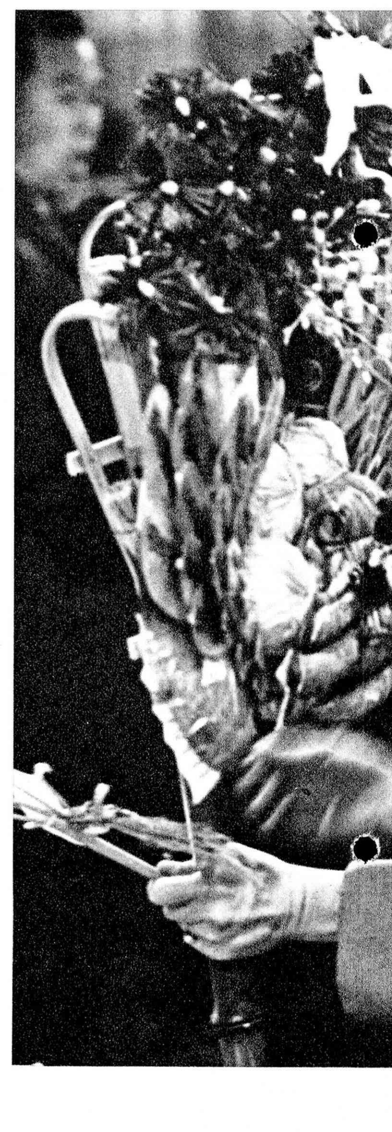
By LEWIS BUSH

Tori-no-ichi or Cock Fair held at many shrines in Tokyo on the days of Cock in November is the first festival announcing the approach of the end of the year. "Kumade" (ornamental garden rakes) of various designs and sizes, closely packing each stall of the fair, are decorated with lucky symbols and signify the "raking in of good fortune."









The Cock Fair at the Otori Shrine in Asakusa is the most famous. In the precinct of the shrine, rows of stalls are set up for selling ornamental garden rakes with the dickering voices of sellers and buyers. None of buyers are so silly as to readily accept the price asked. Nor do they try to knock down the price. It is considered traditional etiquette of "Edokko" (natives of Edo or Tokyo) to give a gratuity to the seller of the rake after obtaining a reasonable price cut.







In mid-December, a fair to sell "shimenawa" and other New Year decorations is held in the compound of Sensoji Temple at Asakusa, which may well be called a symbol of Tokyo. "Shimenawa" is a left-hand plaited straw rope which is so wound because the left is believed to be the pure and fortunate direction.

Farewell to the Sheep and Welcome to the Monkey

By LEWIS BUSH

SIGNS of the year-end and preparations to meet the new cycle of 365 days appear in this huge metropolis at the beginning of November, as well as the first hints of the Jingle Bells, Merry Christmas business. Shops and department stores are beginning sales to clear stocks, there is general anticipation of bumper year-end bonuses, demonstrations by union members not satisfied with what has been offered, and banks, insurance companies, motor-car, electrical appliance, colour TV manufacturers and others are using every effort to persuade folk what they believe is the best way in which the extra income should be spent.

Yet, amid the modern city of elevated super-expressways, TV towers, and the thirty-six storey skyscraper nearing completion, the first significant sign of the season is the traditional *Tori-no-ichi* or Cock Fair, held on the days of the Cock which come twice, or three times during the month, as in 1967, held at Otori shrines where people pray for good fortune in the year to come.



In the religious life of the Japanese, Christians are in the minority. But Christmas has already become an integral part of the nation's year-end festivities, transcending its religious framework. Tokyo's shopping centers set up decorations to mark the Christmas season.

Chief feature of the *Tori-no-ichi* is the sale of *kumade*—ornamental garden rakes which symbolize the raking in of good fortune, sold in various sizes from one inch to enormous ones four feet in length. And each rake is decorated with lucky symbols such as the ripe rice ears, *Takarabune*—treasure ship of the Seven Gods of Luck, *Okame*, Goddess of Mirth, the mallet—*uchide-no-kozuchi* said to grant one's desire if making a wish while striking with it, fish and other charms.

In buying *kumade* it is the custom never to accept the price demanded but to bargain with the vendor who shouts the excellence of his wares, ridicules any question of selling cheaper, but of course takes a lower figure when he claps his hands three times to call attention of the gods, and predicts the purchaser will have a very prosperous year, while reminding him or her to be sure to come for another rake the next year. For once you buy a rake you must get another—bigger and better as the years go by to ensure continued good fortune. As with other fairs at this time of the year stalls and hawkers offer all kinds of wares, plants, trees and shrubs, toys and sweetmeats for the children, to make it a gay and popular event for young and old.

BUT although the signs and portents of the season are well in evidence, it is with the advent of December, the special name for which is *Shiwasu*—very busy time, that things really warm up.

Now the department stores make tremendous efforts to attract customers for Christmas and New Year spending with all manner of displays, Japanese Father Christmas is seen on the Ginza—Tokyo's 5th Avenue or Oxford Street, there is a general activity in preparing to settle accounts, and the year-end house cleaning is in progress.

Each year on December 3rd the *Gosho no harai*—cleaning of the Imperial Palace, commences, carried out by specially selected men who are given a suit on which is inscribed the Imperial crest for them to keep and hand down as an heirloom to their children and grandchildren.

It is in December, too, that companies, government departments and others hold their annual *"Bonenkai"* parties to say goodbye to the year, while bar and night club hostesses are oozing with charm in trying to sell tickets to special Christmas and year-end parties at their establishments.

Now, charms, toys and novelties, new year greetings cards and calendars feature the monkey—*O'Saru* who replaces the Sheep—*Hitsuji* as the zodiacal sign in 1968.

Around December 15th the *mochitsuki* is held, when year men, those born under the zodiacal sign of year to come, pound the rice flour for making the New Year *mochi*—rice cakes of various sizes. This used to be done in the homes but nowadays most people buy their *mochi* from confectioners.



The annual Hagoita Fair in the compound of the Sensoji Temple in Asakusa.



Tori-no-ichi has come to be visited by many foreigners.

Nowadays, the much commercialized Christmas with its parties, sales and decorations, though celebrated as a religious festival by Christians, has tended towards stealing the thunder of New Year, the two coming so close together. But even while the strains of Jingle Bells and Silent Night echo throughout the land, the *kadomatsu* or gate-pine is making its appearance outside homes, offices, restaurants and other establishments. This decoration was originally made of the branches of the young pine, and in fact today is more often than not displayed in its original form. However, the pine, bamboo, and branches of the plum-tree combined is called *Shochikubai,* which has the symbolic significance of all its components—Endurance, Longevity, Strength in the pine, Virtue and Fidelity in the plum, and Courage and Tenacity in the bamboo.

The *shimenawa* is a left-hand plaited straw rope, always to be seen at shrines, which is so wound because the left is said to be the pure or fortunate direction. Some *shimenawa* are enormous, especially those which decorate the important shrines. Nowadays most houses display on the gate a small pine twig with a piece of plaited straw rope fastened with a piece of white paper called *noshigami* while on the door is an orange, emblem of the season, a piece of seaweed or *kobu,* with a whisp of straw rope. Straw ropes and tassels are symbolical of good fortune, and proud are the children of the home which has an imposing *shimenawa* across its doorway.

To these ropes are attached small squares of white or silver paper called *gohei* representing offerings to the gods. Interior decorations consist generally of fern leaves, symbols of prosperity, bitter oranges, a lobster, representing ripe old age, and *mochi* —the cake made of rice flour.

In the *tokonoma,* the alcove or place of honour, where there is one, for nowadays with the high price of land many homes, especially apartment houses do without, are placed two large pieces of *mochi* one above the other, topped by an orange and with a fern leaf. A similar decoration is placed in the kitchen, but in this case the smaller pieces of *mochi* are a tribute to *Sambo Kojin*—God of the Hearth, others are put at the place of work such as a study, for *Suijin Sama*—God of the Well, even in the toilet which has its own special guardian deity, and in some homes even for the rats and mice to induce them not to gnaw away matting, paper screens, or windows.

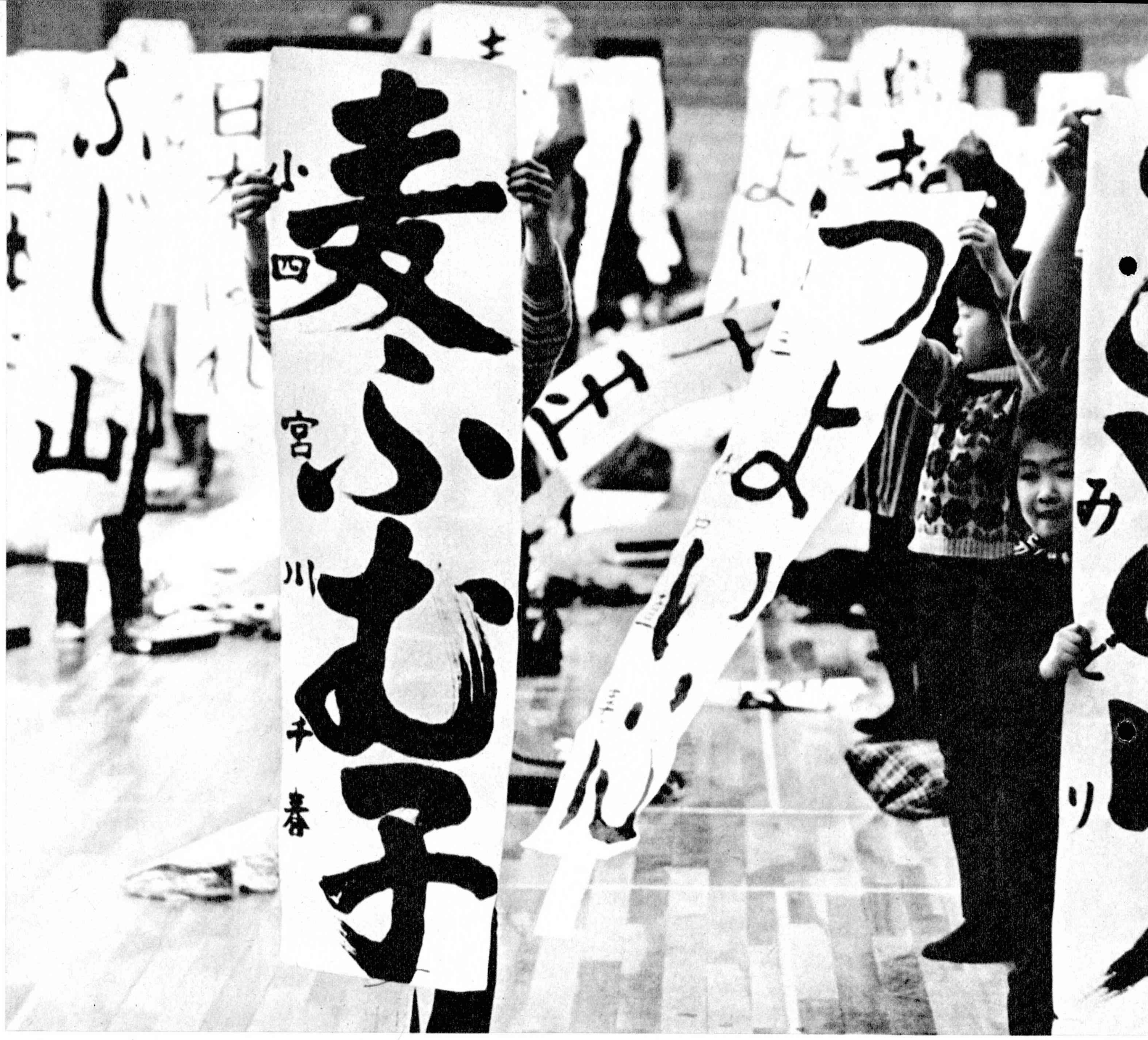
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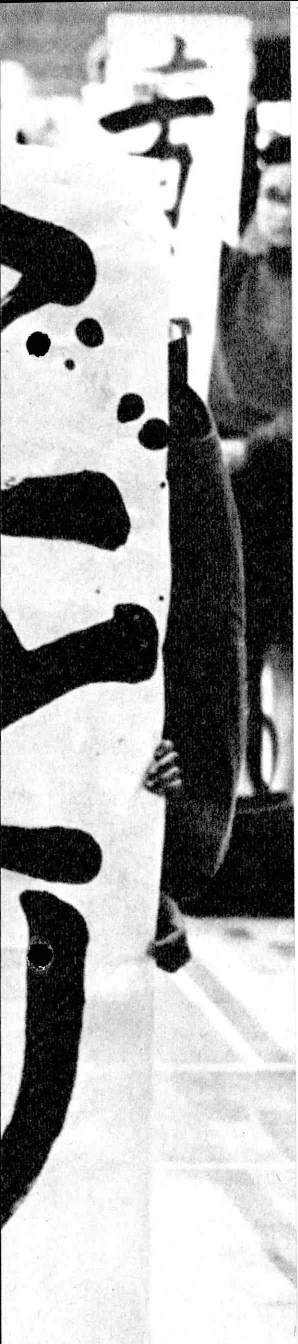
The most colorful fair during the year-end season is Hagoita-ichi or Battledore Fair, held in the precinct of Sensoji Temple December 17, 18 and 19 every year. Hagoita is for playing battledore and shuttlecock during the New Year season. Nowadays, however, Hagoita is valued primarily as an ornament. About 40 stalls are set up at the fair to sell Hagoita bearing portraits of ancient Kabuki actors and TV actors and actresses of the present day.


東上野
研勝
売約済
音羽家

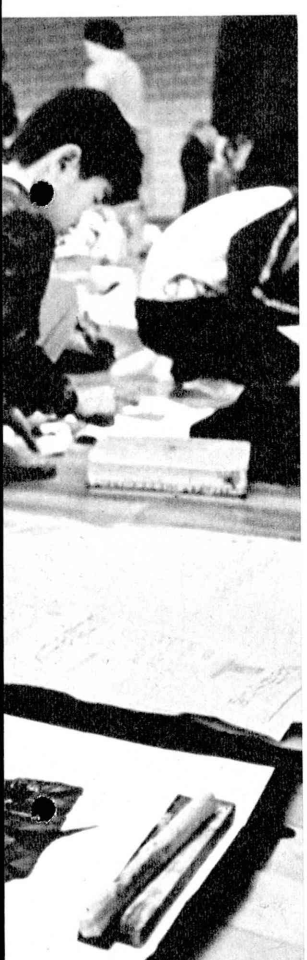

麦ふむ子
小四
宮川千春



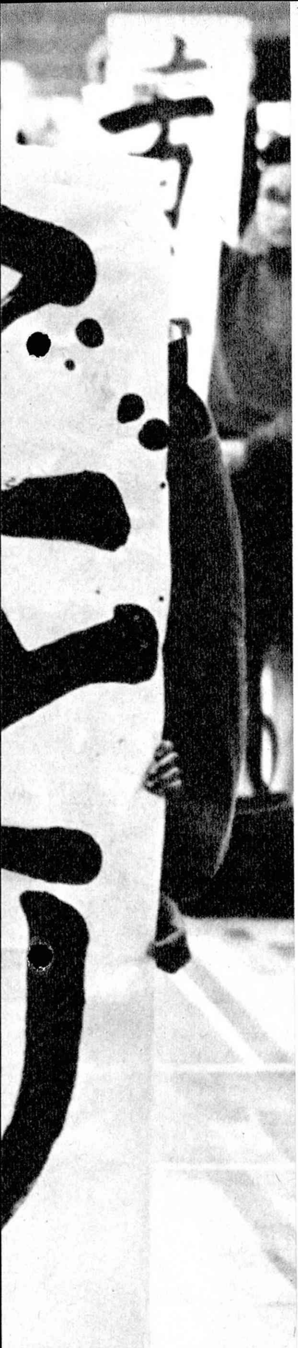


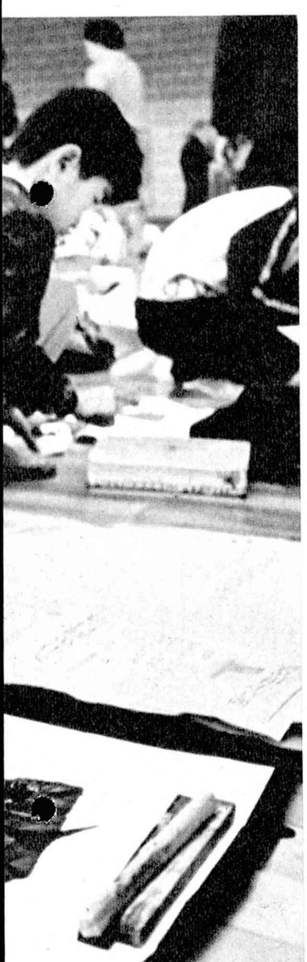


Kakizome (first writing of the year) is another time-honored custom of the Japanese. Even young people, who seldom use writing brush in daily life, write words of faith or hope on white paper at New Year's Kakizome. Photos show a grand Kakizome meeting held on January 4 annually at the Nippon Budokan Hall. This year, over 1,500 persons took part.









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The New Year season is the time for revival of traditional Japanese atmosphere. Kimono-clad young ladies emanate a unique charm that cannot be attained by Western-style cloths.



Playing battledore and shuttlecock during the New Year used to be a common sight.

AND so with Christmas over, year-end sales, business ended, all is ready for the Year of the Monkey when just before midnight on 31st December, the bells or rather gongs of temples throughout the country commence striking the *joya-no-kane* the 108 strokes. According to Buddhist belief these represent the evils which beset mankind. And when the last echoes die away and these evils have been exorcised, mankind is considered free and prepared for a new page in the book of life and the greeting to all is *"Shinnen O'medeto—"* Congratulations at achieving the New Year.

This is a time of great happiness for the young who want to grow up in a hurry, but to the middle-aged and elderly it is more often than not a grim reminder of the swift passage of the years.

In the 15th century it is said that the poet Ikkiu used to go from door to door reciting:

"Kadomatsu wa
Meido no tabi no
Ichirizuka,
Medetaku mo ari,
Medetaku mo nashi."

Meeting the New Year Decorations
At every stage
On the way to eternity
One finds congratulations,
Yet finds them not.

He must have been as popular to elderly folk as the tax collector.

Japanese New Year has always been regarded as a sort of birthday of the nation and although much of its significance has faded, yet the season is pregnant with symbolism and customs, many of which go back through the centuries to beyond the dawn of history.

The shrine, the Shinto place of worship had its beginnings long, long before the introduction of writing. It developed from pre-historic times when no doubt it represented the hearth of a tribal chieftain and the sacred repository of the spirits of ancestors transformed into gods. Today, in spite of all the ramifications of science and the space age, at New Year millions pay their respects to the gods of the nations at shrines throughout the land to give thanks for blessings bestowed upon them in the past and to offer prayers for consideration of the deities in the New Year which has just dawned.

Few go to bed on the first morning of the year, but sit around with friends and relatives drinking, talking and eating, and hoping to see the first sunrise. Those fortunate enough to live in the district still endeavour to obtain a first glimpse of Mount Fuji. For this peerless mountain, ever elusive to mortal eyes during the greater part of the year, is invariably kind enough to show herself in the keen clear air of New Year's day. Poet Sokan, who lived in the fifteenth century wrote:-

"Gwanjitsu no
Mirumono ni sen
Fuji-no-yama."

Peerless Mount Fuji
Should be reserved as a special sight
For New Year's Day.

ONE pleasant aspect of New Year is the blossoming out in kimono by girls and women who in the ordinary way must wear Western type clothing for practical and economic reasons, to make the season a veritable "Kimono Blossom Time."

On New Year's morning many people used to visit twelve shrines, some still do, and especially young girls who had attained the unlucky age of nineteen to seek protection of the gods during the year.

Hatsuburo on New Year's morning, the first bath provides for the cleansing of all the physical pollutions one may have contacted in the past year and, emerging from the tub you are said to be re-born—like a babe emerging from the womb, cleansed in body and in mind.

Traditional food at the first breakfast has its special significance which denotes a marked fear of death judging by its supposedly health and lifegiving properties. *Mirin,* a sweet wine, flavoured with *Toso* a mixture of herbs, stands for revitalization, the *mochi,* fortitude, *kazunoko*—dried herring roe soaked in sauce (too expensive nowadays for most people) symbolical of family prosperity, *gomame,* dried fish fried with sauce, pointing to good health, and black beans boiled and flavoured, long life.

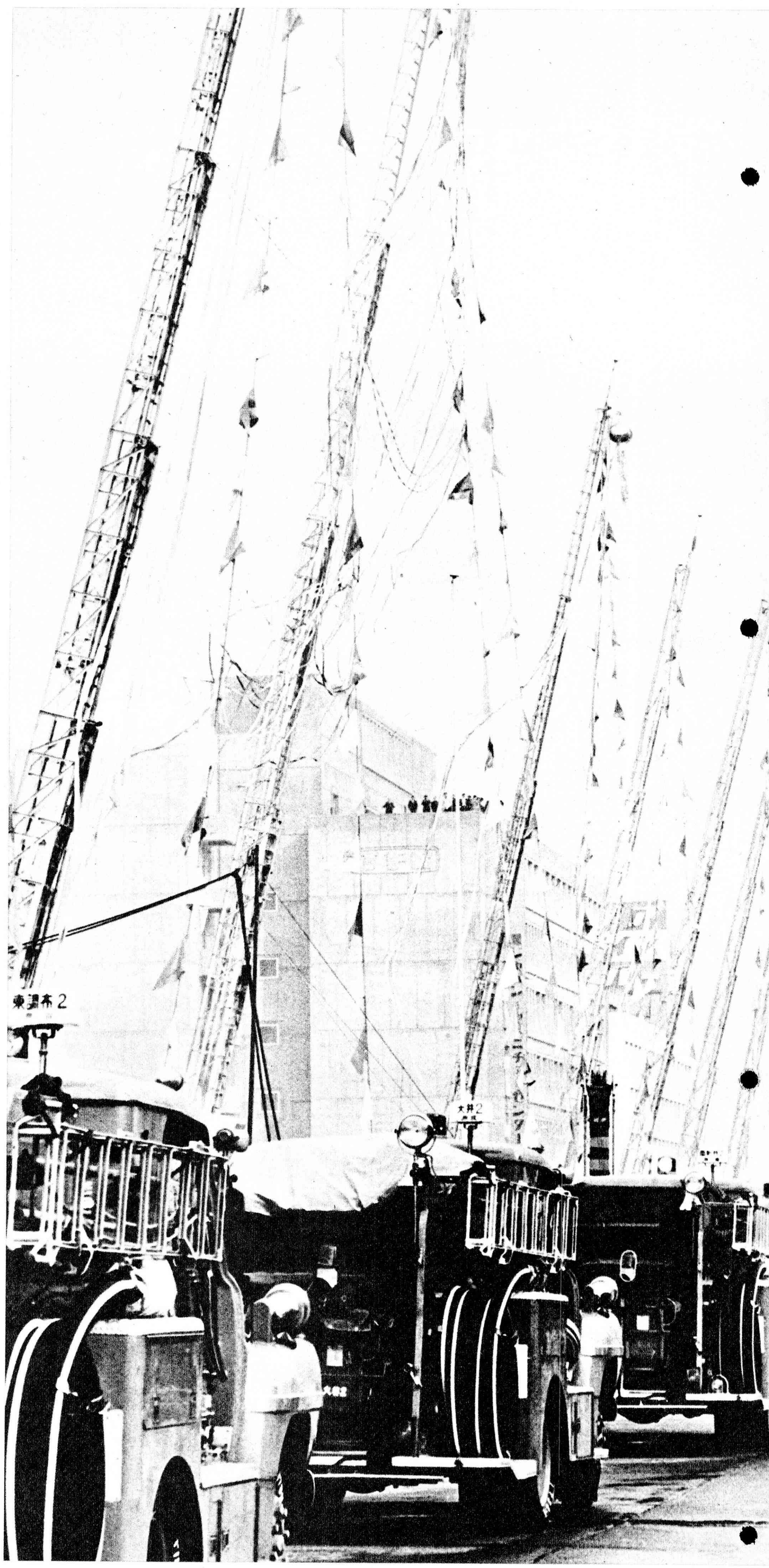
During the holidays young girls are seen playing battledore and shuttlecock—*hagoita,* and sometimes, even in the cities, the old time *manzai* or strolling musicians pay a call and entertain the neighbourhood with their jests and antics. A popular game at this time of the year with young and old is *Uta-garuta,* a card game in which two sets are used of one hundred each, one having pictures and the other poems which correspond to them and must be matched.

The second of January is considered as the true beginning of the New Year when business opens for a short time and trucks and carts are seen decorated with banners to announce the occasion. On this day hawkers go about selling pictures of the *"Takarabune"*—the Lucky Treasure Ship — containing the Seven Lucky Gods, which is supposed to make port with New Year. These are placed under the pillow to ensure lucky first dreams—*"Hatsu Yume."*

There is a great deal of visiting and receiving the visits of friends during this season and on such occasions it is always customary to serve the guest with a small cup of the sweet wine called *mirin* but on this occasion *o'toso* because of the herbs of that name which are mixed with it.

The New Year festivities end with the *Dezomeshiki,* the review of the first brigades on the 6th of January, which in Tokyo takes place at Harumi. After the parade and the fire fighting exercises old-time fire fighters from the volunteer brigades perform acrobatic tricks on high bamboo ladders, prizes are awarded and badges of merit given to firemen and brigades which have rendered outstanding services during the year.

Nowadays so many people celebrate holidays away from home, some go to hot spring resorts, skiing, even abroad to such places as Hongkong, Taiwan, or Hawaii. But wherever they may be, they are certain to observe certain of the customs which have endured over the centuries, and all experience a sense of being given a new start in life. And so ends the Year of the Sheep and the dawn of the twelve months, presided over by *O'saru Sama*—The Most Honourable Monkey.







One of the traditional New Year events that Tokyoites look forward to is "Dezomeshiki," the Grand New Year Parade of Tokyo's Fire Brigades. It has its origin in the early 18th century when organized fire fighting was begun on a big scale in Edo or present Tokyo. Left and bottom: Volunteer firemen with their traditional "happi" coat and "matoi" standard demonstrate the fire fighting method of Edo Era. Far left and below: Parade of extension ladder trucks. Year after year, more time is given for demonstration of modern fire fighting equipment such as chemical foam ejecting devices and high pressure guns.











The biggest attraction of the Dezomeshiki is "hashigo-nori" (acrobatic tricks atop high bamboo ladders), performed by the members of a society for preservation of fire fighters' customs of the Edo period. "Hashigo-nori," drawing a far louder applause than the demonstration of ultra-modern fire trucks, is a vivid reminder that the tradition of ancient Edo still breathes in the mind of Tokyoites.



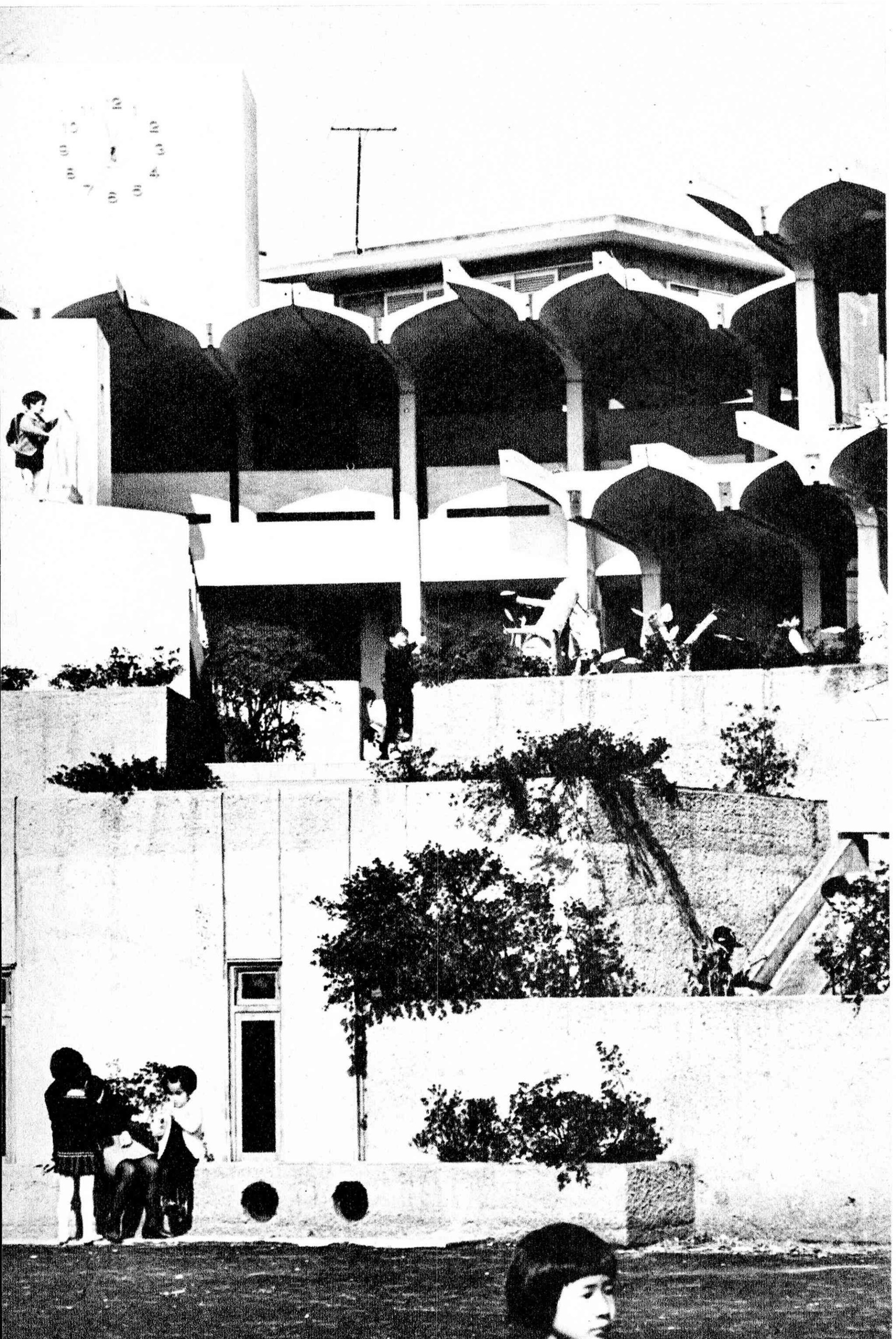
Soul Nursing Castle for Children

Yukari Bunka Kindergarten

Square holes in the wall arouse the curiosity of the children.

A child playing cheerfully on a slide boasted: "Our kindergarten is wonderful, don't you think? It's the best in Japan, we are told." And the boast sounds only natural when you look at the Yukari Bunka (Cultural) Kindergarten (director: Matao Fujita) at Kinuta, Setagaya-ku, Tokyo, which may well be described as "de luxe." Yet it is not merely a de luxe structure, but also a full embodiment of ideals cherished by educationists and architects towards kindergarten education. The exterior appearance of the kindergarten building is marked by beautiful geometrical curves formed by layers of many semicircular roofs with irregular lengths. It exudes a dreamy atmosphere like a castle in a fairyland.

"The kindergarten building should not be a mere structure to house a group of children. Every detail of it should constitute material for human education. To give full play to children's boundless possibilities, they should be furnished with a place for their education that is filled with freedom and variety." This basic concept underlies the design of the Yukari Bunka Kindergarten, one of the latest works of Dr. Kenzo Tange, a world-famed architect, and his group. It is a two-story ferroconcrete structure with one basement, the total floor space being about 1,300 square meters. (Since the site for the building forms



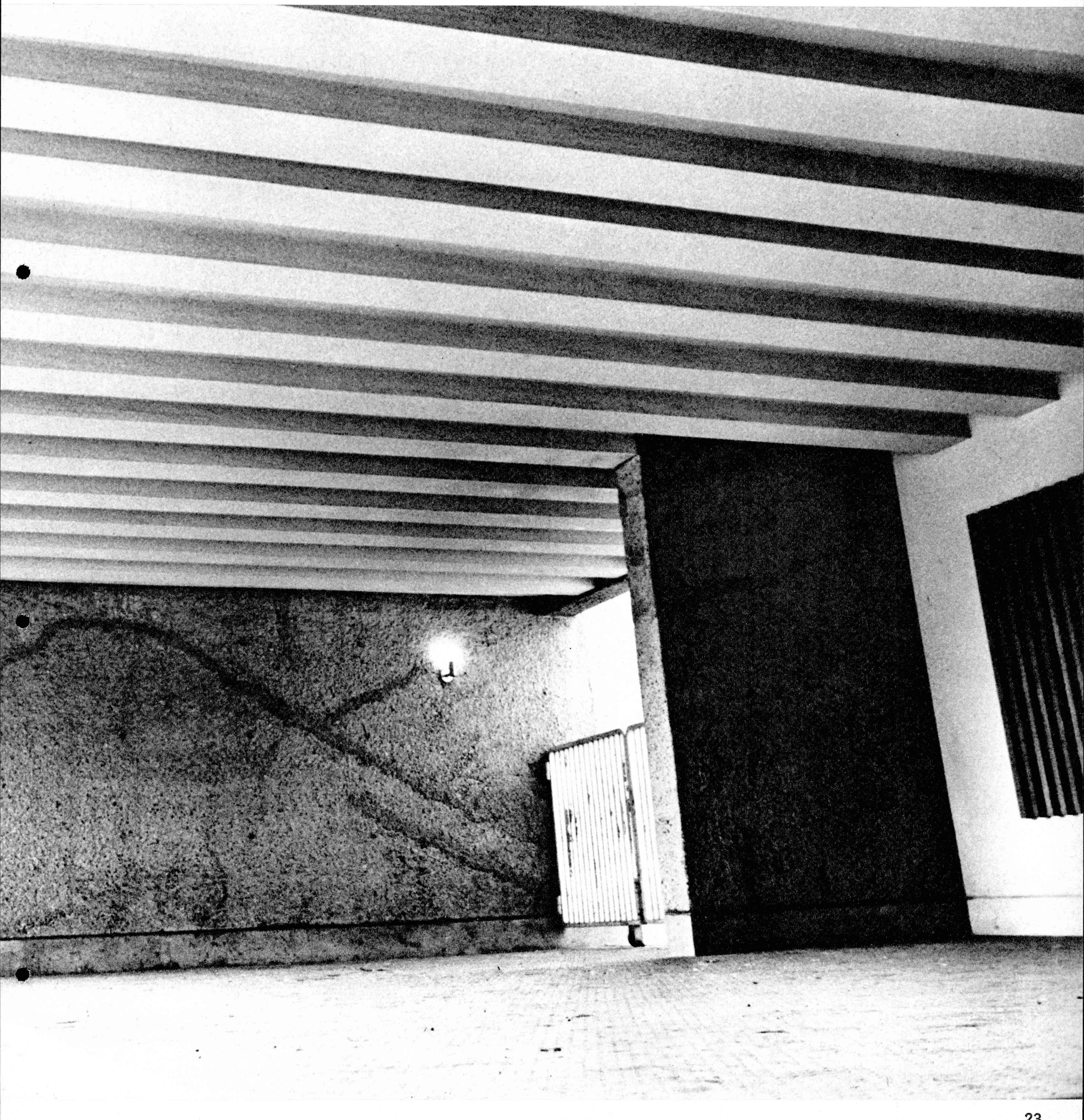
The building splendidly embodies the belief of its designer that "the education of children should seek to help develop the unlimited possibilities of each individual child, and therefore, any building which confines children to a certain fixed place is not appropriate."



a slope, the southern side of the basement is above the ground, fronting on the playground.) The administration office and other facilities for the management of the kindergarten are concentrated in the basement, while the first and second floors consist of important nursing facilities, such as the classrooms, music, art, test, play and recording rooms.

The arrangement of rooms differs completely from ordinary kindergartens composed of those of the same size and style.

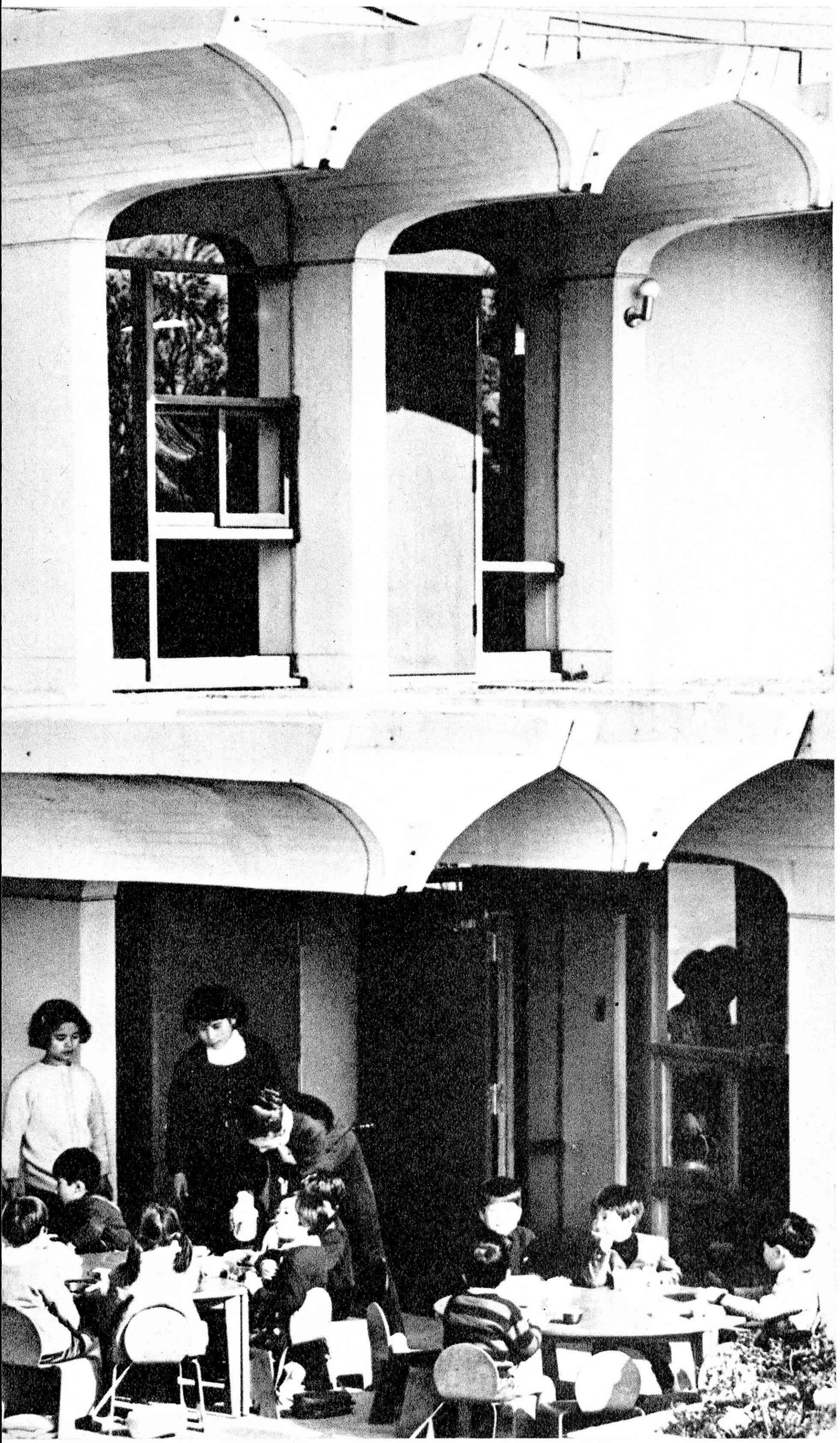
For instance, the classroom is divided into two sections—one with a bare wooden floor and the other carpeted. Pupils listen to the teacher's story in the former, and play freely in the latter, lying down and rolling about. In a corner of the second-floor play room is a small, carpeted cave-like place called "Toy-Housekeeping Play Room." For most children like to play in a small place or cave. And the special corner exactly satisfies such propensity. There is also the "Corner for Talking" on the first floor. There, children sometimes watch pictures-story shows or can indulge in reverie. At any rate, each space is full of creative imagination. Moreover, the corridors linking these spaces are more than mere passages. There is the mazelike "Thinking Road" on the first floor, while on the corridor linking the terrace and the classroom, chil-



dren acquire a sense of sociability while playing together noisily, and an attitude of independence and spontaneity while leaning against the pillar to be absorbed in thought alone.

The Yukari Bunka Kindergarten was founded in 1947 by its Director Fujita. From the first, he wondered if the conventional structure of kindergarten—namely, a row of nursery rooms along a corridor—was really suitable for the education of infants. He thus started to ponder what structure would be best suited to allow children to learn things sensuously and acquire sociability through group life. Finally, he arrived at the conclusion that "since important education during infancy, which is an initial period of character building, is conducted in the space created by human beings, such should be replete with all possibilities as well as rich in variety." Therefore, on the occasion of building a new kindergarten to replace the old structure, Fujita entrusted the designing work to Dr. Tange, who shared his opinion about kindergarten education. Dr. Tange and his group observed the pupils' behavior and life thoroughly at first hand over a year and a half, and then designed the unique building on the basis of their findings.

The Yukari Bunka Kindergarten has also





Mr. Fujita, head of the kindergarten, says: "I earnestly hope that all my children will love the fine arts, enjoy music, speak nicely, acquire beautiful humanity, affection and sociability, and grow in good health." The building of the Yukari Bunka Kindergarten is believed ideal for the realization of his wish.

adopted a new creative system as regards the method of education. That is, each class is in the joint charge of three or four nurses. This is a complete departure from the conventional system whereby each class is kept to a single one all the year round and cared for by the same teacher for that period. The new system is designed to prevent the character of a single nurse from affecting children too strongly and to let children come into contact with teachers of different characters as often as possible so that they may freely develop their personality.

It is believed that the adoption of creative concepts at the Yukari Bunka Kindergarten in not only the structure for kindergarten building but also the system of nursing suggests a new direction of kindergarten education for the future.





HOKKAIDO:
japan's land of promise



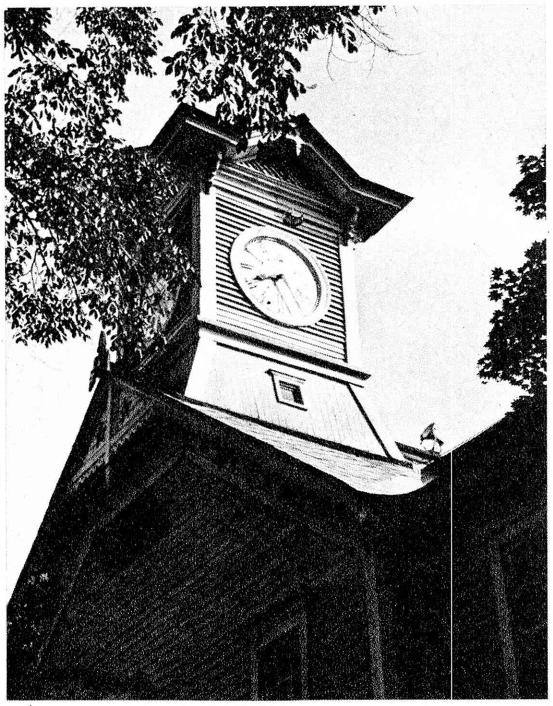
Karikachi Pass in central Hokkaido is famed for a particularly extensive view. (Photographed by Naotaka Hirota)



Japan's Land of Promise

FROM the uptown residential area of Tokyo, a half an hour's irritating drive through crowded streets brings you to the speedway on which you drive to the airport in another 30 minutes.

Jet flights from Tokyo to Hokkaido are offered every 30 minutes by two carriers—Japan Air Lines and All-Nippon Airways—which vie with each other for better service. As the plane takes off and you unfasten the seat belt, you will find yourself relaxing in the comfortable reclining seat. No sooner than you start sipping coffee served by the hostesses, part of Japan's northernmost island of Hokkaido—the land of promise—will come into view among the snow-white clouds outside the window.



An old wooden clock tower in Sapporo.

You look at your watch; it's only one hour—the time it takes many office workers in Tokyo to get to work. As you deplane at Chitose Airport, the air gateway to Hokkaido, you notice the clear sky above free from the smog you are used to in Tokyo. The air is crisp, with the temperature at least 10 degrees lower than in Tokyo.

The 40-kilometer highway that leads in a straight line from the airport to Hokkaido's largest city Sapporo cuts through a vast expanse of fertile rice paddies dotted with farm houses which form small villages along the route. The scenery gives one the impression of a continent within the insular country called Japan.

Hokkaido is the northernmost of the four main islands which constitute the Japanese archipelago. Second largest after Honshu in land area, Hokkaido is the most youthful part of Japan with a history of only 100 years of modern development.

Until the dawn of modernization at the beginning of the Meiji era, Hokkaido was known as the land of the Ezo covered with primeval forests and plains alive with wild life including bears, deer and wolves. Defying the wilderness and merciless winters (temperatures drop to 40 degrees C. below freezing point), there was but a handful of Japanese who had settled down there to conduct trade with the Ainu aborigines.

The district marked the first step to modernization when the Meiji Government newly named it Hokkaido and launched an ambitious 10-year development program to tap the rich natural resources of fishing, lumbering and mining. The program was aimed partly at fortifying the island against possible Russian infiltration from the north.

Hoping to emulate the United States, where development of the Western frontier was then being carried on successfully, the Japanese Government invited American experts in agriculture, mining and civil engineering and imported American machinery, farming implements, breeding stock and plants. Under Government protection, Hokkaido thus became Japan's new frontier.

One of the Americans who helped Japan develop Hokkaido has a special place in the heart of the Japanese. The memory of this American, Dr. William Clark, is perpetuated in a bronze bust that stands on the campus of Hokkaido University, formerly Hokkaido Agriculture School, in Sapporo. On the base of the bust, there is the inscription: "Boys, be ambitious." These are the parting words that Dr. Clark left with his students before leaving for home after devoting a year to teaching at the agricultural school. Even today these words are often quoted as representing the pioneer spirit of Hokkaido.



The bust of Dr. Clark at Hokkaido University.

PRESENT-DAY Sapporo, with a population of 850,000 and covering an area of 1,118 square kilometers, is the political, economic and cultural hub of Hokkaido. The highly developed urban area has been called "Little Tokyo" by visitors.

The TV tower rising above the heart of Sapporo commands a fine view of the central boulevard which runs from one end to the other end of the city. The green belt that divides the 105-meter-wide street is a virtual park which in the summer is set aflame with multicolored flowers and in winter provides the stage for the famous Snow Festival attracting visitors day and night with the artistic snow carvings. Night life adds to the enjoyment of travelers who have a choice of 4,000 night clubs, bars and late restaurants where fresh sea foods and other dishes are served.

Sapporo's prosperity is supported by the abundant catches of fish in neighboring waters, rich supply of coal and lumber, and bumper crops and dairy products from the large-scale farms. In addition, manufacturing industries producing steel, paper and beer have made rapid strides in recent years.

While making up 20 per cent of the total area of the country, Hokkaido accounts for only 5 per cent of the national population and income. Population density here is 66 per square kilometer, or the lowest of any area in this country, although far higher than 17 and 11 for Sweden and Norway, where weather conditions are similar to those of Hokkaido. Hokkaido thus has much room for development of its secondary and tertiary industries; hence the "Land of Promise."



Snow sculptures at Sapporo's Snow Festival.

HOKKAIDO is fast emerging as a new tourist center on a grand scale. It features mountains towering more than 2,000 meters above sea level and studded with gems of sparkling lakes. The most easily accessible of all tourist spots there is the national park of Lakes Shikotsu and Toya. It can be reached by three hours' train ride from Sapporo.

The serene Lake Shikotsu, surrounded by volcanic mountains of Tarumae and Eniwa, measures 40 kilometers in circumference and has a depth of 300 meters, deeper than any other lake in Hokkaido. Trout are bred here and in summer the lake becomes crowded with trout fishing boats.

By contrast, Toya is femininely radiant. It is a typical caldera lake with an island in the center. Summer draws many boating fans and water ski enthusiasts here. Other seasons offer their respective natural charms. Western and Japanese style accomodations are available along the banks where hotsprings gush out here and there. A special attraction of this national park is Showa Shinzan, a baby

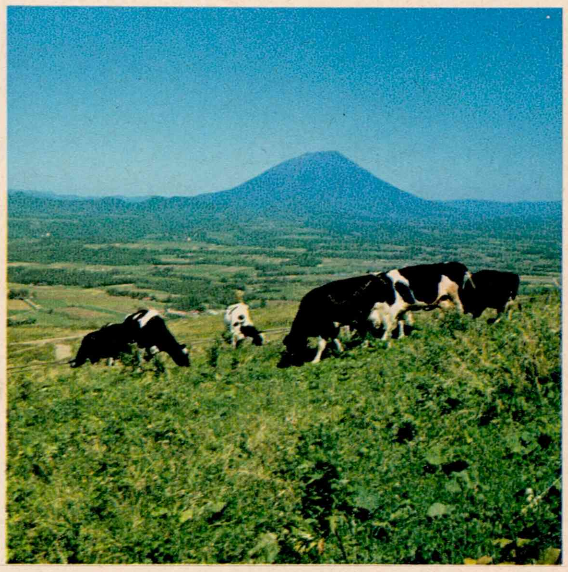
volcano born in 1943 not far from Lake Toya. The 408-meter mountain—a product of repeated eruptions and upheavals in a bean field—still today spouts steam from the odd-looking chunk of earth.

At the foot of the Shikotsu-Toya mountains lies the famed Noboribetsu spa, the largest in Hokkaido and first in the Orient in terms of volume and variety of mineral water. The valley of Noboribetsu swarms with huge hotels equipped with mineral baths that can accommodate several hundred bathers at a time. The hotsprings are said to draw more than a million tourists annually.

A three hour's train ride to the north of Sapporo brings you to Hokkaido's second largest city Asahikawa, passing through the oldest granary of Hokkaido. Asahikawa lies approximately in the center of the island and consequently represents an important junction for overland transport services.

Driving east along the Ishikari River, deep into Mt. Daisetsu, the roof-top of Hokkaido, you reach Sounkyo in about an hour and a half famed for its enormous ravine and mineral springs. Proceeding further east, crossing Hokkaido's backbone at Sekihoku Pass, you come to the Okhotsk Sea coast—a bleak stretch of land as far as the eye can reach.

If you turn off to the south at Bihoro on your way to the north-eastern coast, you soon come to Akan National Park—an enchanted land of forests and lakes (Akan, Mashu and



Agriculture in Hokkaido is tending toward diversification supplemented by stock farming.

Kussharo). Lake Mashu, on the slope of Mt. Mashu (853 meters), is only 24 kilometers around but is quite deep at 280 meters and one of the world's clearest lakes, with a clarity of 30 meters. Looking down from a 200-meter cliff nearby, you find the water a mystic indigo. Small wonder the indigenous Ainus referred to Mashu as the "Lake of God" and the islet in the center as the "Islet of God."

Lake Akan is known for its unique species of sphere-shaped alga, familiarly called "Marimo" (ball weed), and its hotspring-rich banks. The crimson maple leaves in autumn are a special attraction. By the lake there is a colony of Ainu who make a living of carving wooden bears or operating souvenir stores.

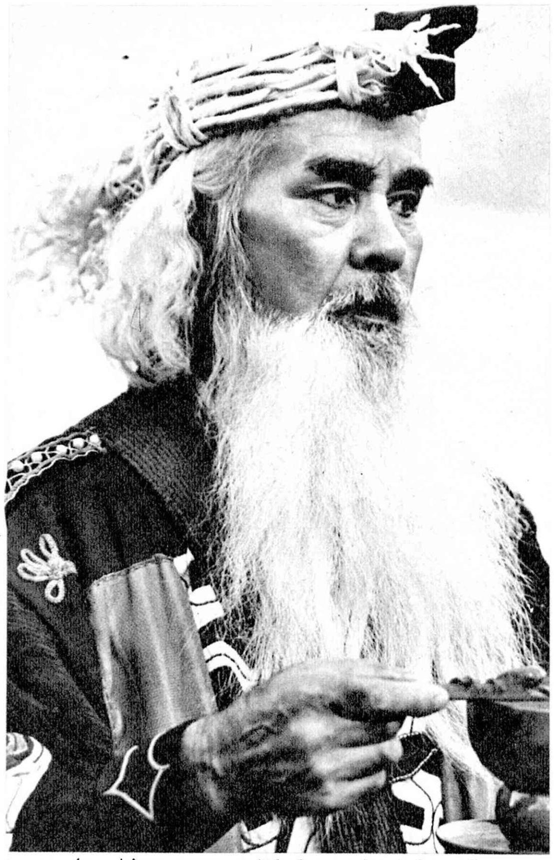
The Ainu are an indigenous Caucasoid peo-



The Central Boulevard of Sapporo, the capital city of Hokkaido.

ple of Japan formerly occupying most of the archipelago but now confined to part of Hokkaido, Sakhalin, and parts of the Kurile islands. Today about 15,000 Ainus survive in the whole of Hokkaido, but most of them, through intermarriage with the Japanese, are difficult to distinguish by sight. They are Japanese by right of birth and are treated as such in all respects, with absolutely no discrimination.

Until about 100 years ago, when the tide of modernization began to wash the shores of Hokkaido, the Ainu had lived in their own way clinging to their unique civilization handed down from generation to generation. The



An Ainu man with luxuriant beards. (Photographed by Tadashi Sato)

Ainus are known to world anthropologists as a rare specimen of development of human civilization. For centuries they had led a life of isolation in this huge island without being exposed to outside influences either ethnically or culturally.

THE modern highway that heads south from Akan National Park runs straight to the Pacific coast fishing port of Kushiro through tundra-like terrain. The barren plain, where earth freezes to a depth of 50 centimeters in winter, provides a breeding ground for a species of graceful white crane with a red crest unique to Japan (Grus japonensis). This wasteland is now being steadily developed, with 10,000 hectares already converted into a pilot forest of pine trees.

Kushiro city is a base for northern Pacific and coastal fishing activities. Every summer the harbor of Kushiro is crowded with thousands of fishing boats.

Besides primary industries—e.g. farming, fishing, mining—modern manufacturing industries, such as steelmaking and papermaking, have recently contributed a major driving force for economic development of Hokkaido.

Industrial activities in Hokkaido today center on the two cities of Muroran and Tomakomai. Muroran has the two big mills of Fuji Iron and Steel and Nippon Seiko. The bay is lined with factories of Nippon Petrochemicals, Fuji Cement and other companies.

Tomakomai has the world's largest paper mill for newsprint which belongs to Oji Paper Co. Pulp making has developed in a big way in this area. Piers for 10,000-ton ships have partly been completed there under plans to attract big factories. Tomakomai promises to become the largest industrial center of Hokkaido.

UNLIKE most other parts of Japan, which are blessed with a relatively mild winter, Hokkaido can become miserable in this season. Temperatures drop to 30 degrees C. below zero in many places inland, while the Okhotsk coast becomes ice-bound. Elderly people spend much of their time crouched before the fire-place.

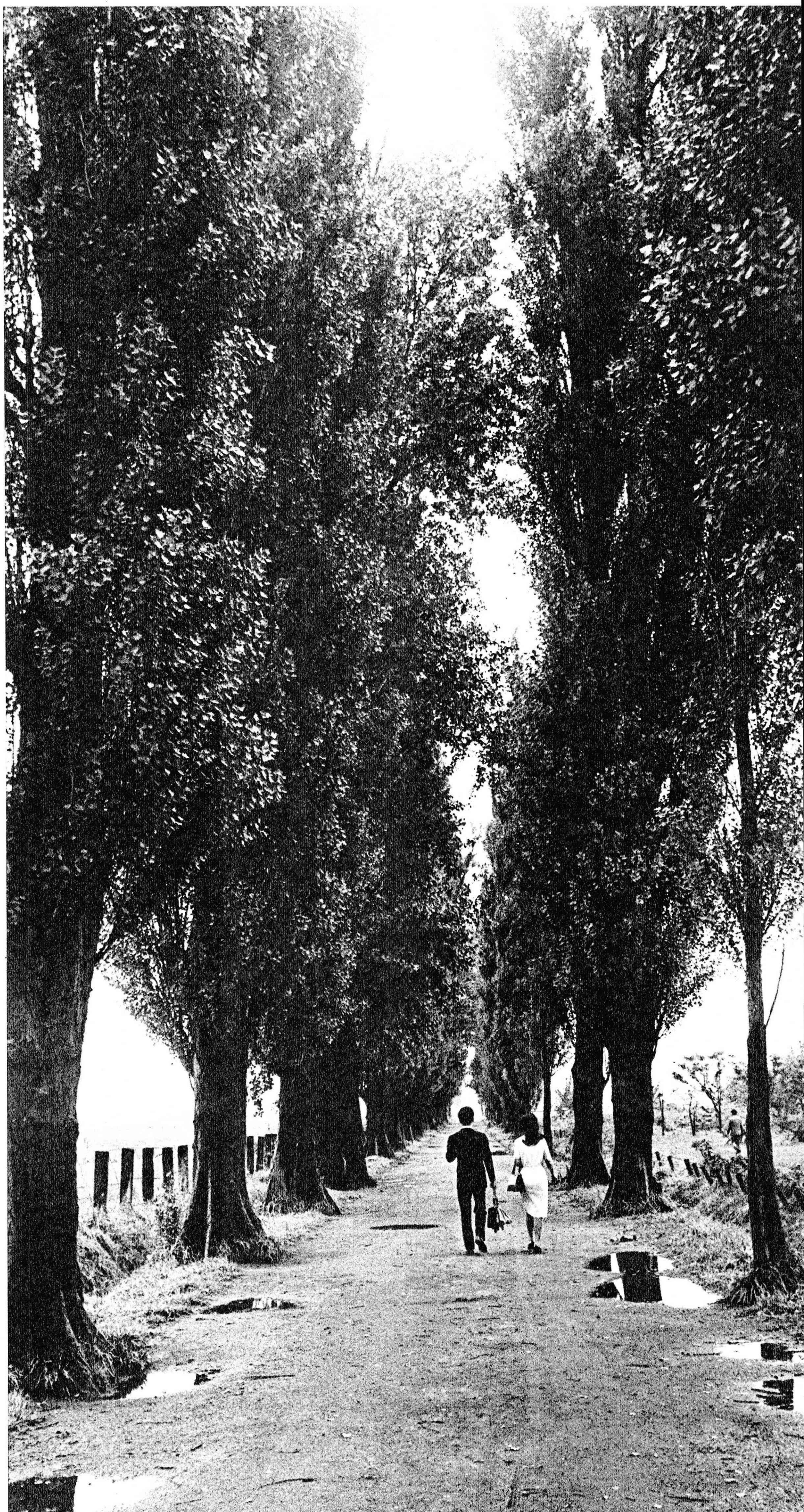
At the same time, winter turns Hokkaido into a paradise for skiiers and skaters. Every February, Sapporo puts on a Snow Festival which attracts hordes of guests from other parts of Japan. Snow country is at its best in winter, some say.

Meanwhile, the International Olympics Committee has chosen Sapporo as the site for the 1972 Winter Games. City authorities are going all out preparing for skiing and skating facilities including those for the jumping contests at Okurayama in the suburbs, where a stand for 50,000 spectators is being built. Athletes and visitors who will converge on Sapporo from all parts of the world will certainly be impressed by the rapid strides made by Hokkaido—Japan's northern frontier.



The contrast between old and new buildings bespeaks the rapid progress of Sapporo.





The poplar-lined lane in the compound of Hokkaido University is familiar as a symbol of the growing Hokkaido.

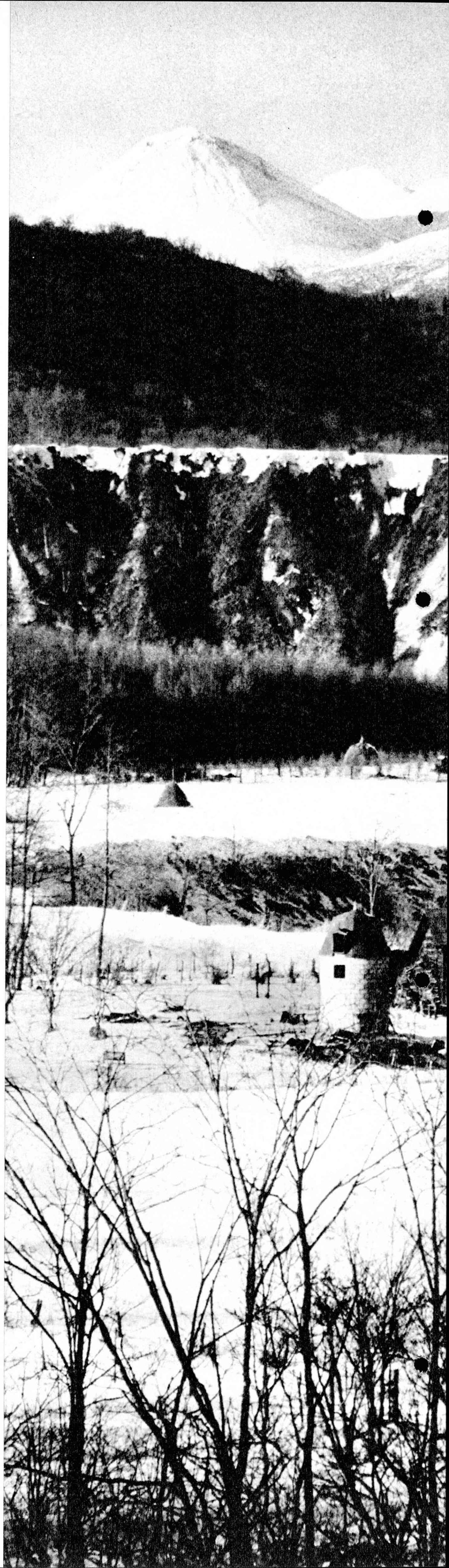




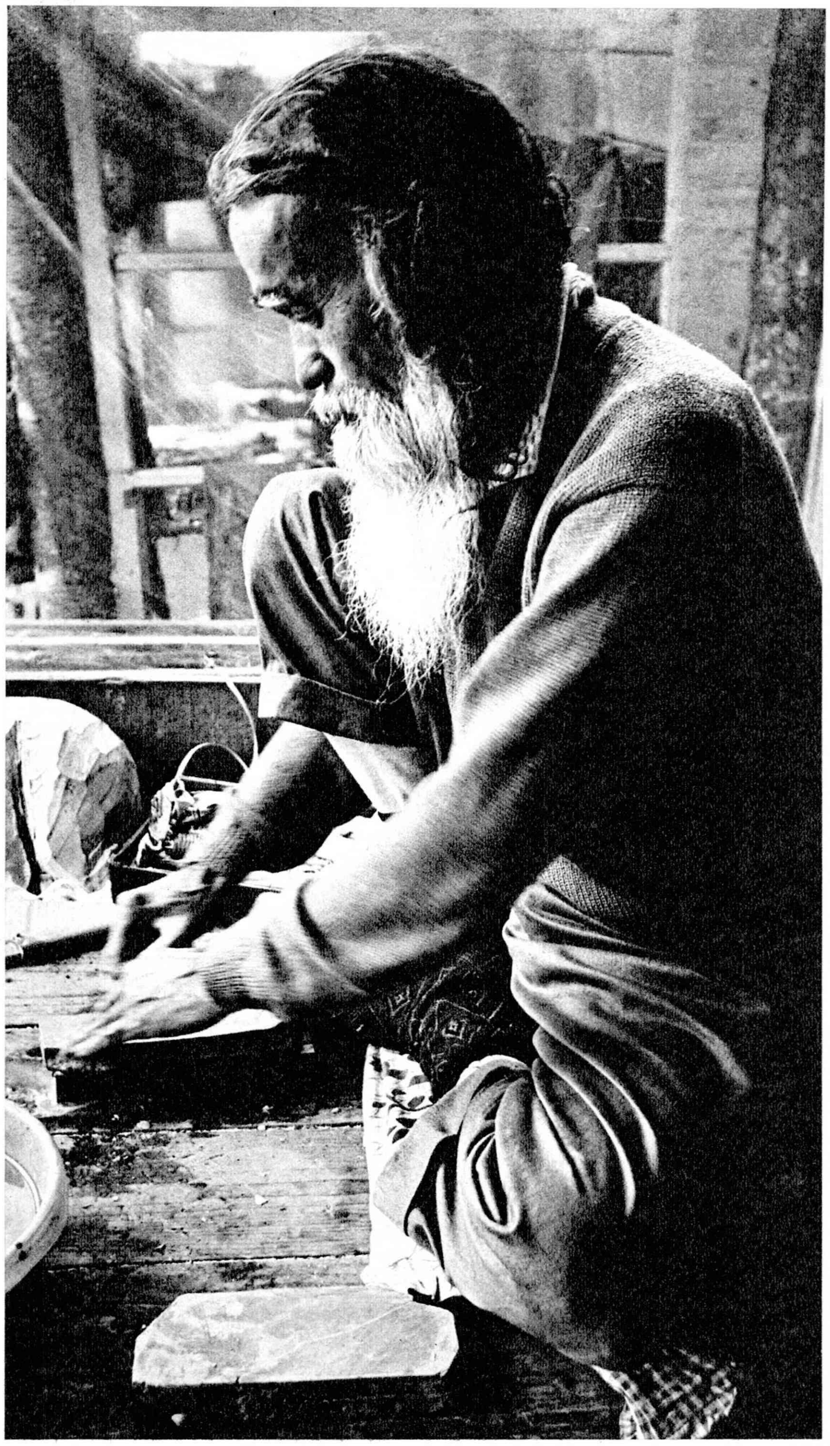
Showa Shinzan, 408 meters high, is an active volcano in Shikotsu Toya National Park. In 1943 and 1944, several earthquakes were felt in this locality, which caused the vegetable fields rise all of a sudden and a new volcano was formed. A rare phenomenon, the baby volcano is now under government protection as a "Natural Monument." Toya Ropeway leads to the top of Mt. Usu (725 meters high) and offers a bird's-eye view of Showa Shinzan.



Lake Mashu, a mysterious lake well known through a legend of the Ainu, has now shed its veil of mystery before tourists.







Carvings by the Ainus are highly valued for their fresh charm in Japan's handicraft.

A farming house at the foot of Mt. Akan. The beautifully painted roof of silo contrasts charmingly with snow-covered mountains, presenting a totally different view of farming village from that in other parts of the country. (Photographed by Kazuo Takahashi)



Lake Toya, a caldera lake, is one of the principal features of Shikotsu Toya National Park and has a thickly wooded island in its center.



Red-crested white cranes living in the Kushiro grassland are carefully protected by the government. (Photo by Hiroshi Tsuchiya)





The Hidaka region is Japan's largest breeding center of race horses. Thoroughbred colts are trained in the snow fields. (Photographed by Hajime Kato)

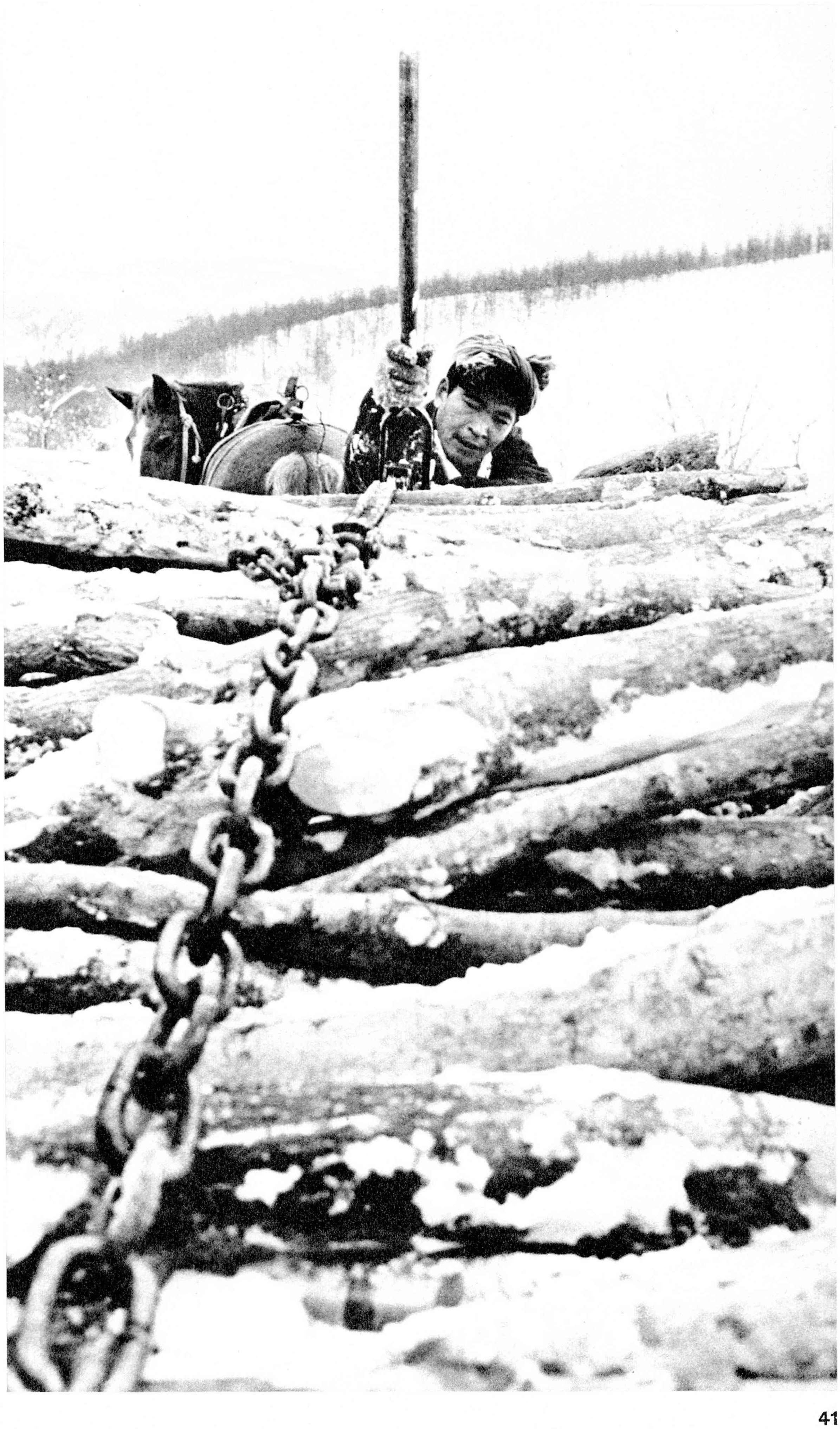


Above: Rice-growing areas continued to expand northward thanks to the strenuous effort of early settlers in the northern parts of the country, and at present, the grain is produced in most of Hokkaido. Checkers of paddyfields extend as far as the eye can reach. (Photo by Kazuo Kumasaka). Right: Kushiro is one of principal fishing ports in Hokkaido, as important foothold for fishing in northern waters. Fishing boats leaving the port sometimes battle the stormy sea for several months.





Although mechanization has made considerable progress, lumbermen still have to fight snow deep in mountains to haul out logs by horse. Lumbering is one of Hokkaido's three primary industries, the others being agriculture and fishery. (Photo by Sukeo Iizuka)

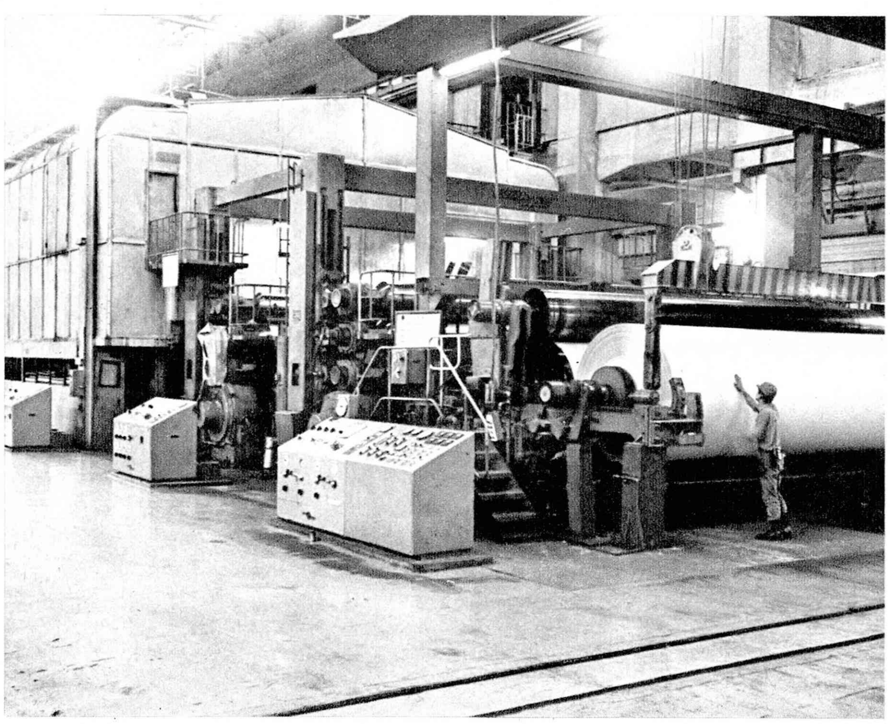












Opposite page: The Tomakomai Mill of Oji Paper Co. in Tomakomai, one of promising industrial cities in Hokkaido. The mill, boasting the world's biggest newsprint production capacity, supplies as much as 30 per cent of Japan's needs for this item. Above: To secure adequate forestry resources for the paper-pulp industry, the Oji Institute for Forest Tree Improvement is studying developing new species of trees capable of rapid and robust growth. "Oji Poplar," bred at this institute, has cut growth period to half compared with conventional species. Left: The New No. 1 Paper Machine installed in the Tomakomai Mill. Wire width is 6,960 millimeters and the maximum speed is 700 meters per minute.



A night view of Muroran, a heartland of Hokkaido's heavy industry, bristling with smokestacks of steel mills, petrochemical complex, cement, dockyard and other factories. (Photo by Keizo Yoshiwara)

HUMAN NATIONAL TREASURE

Kodo Otomaru

A Master Lacquer Ware Artist

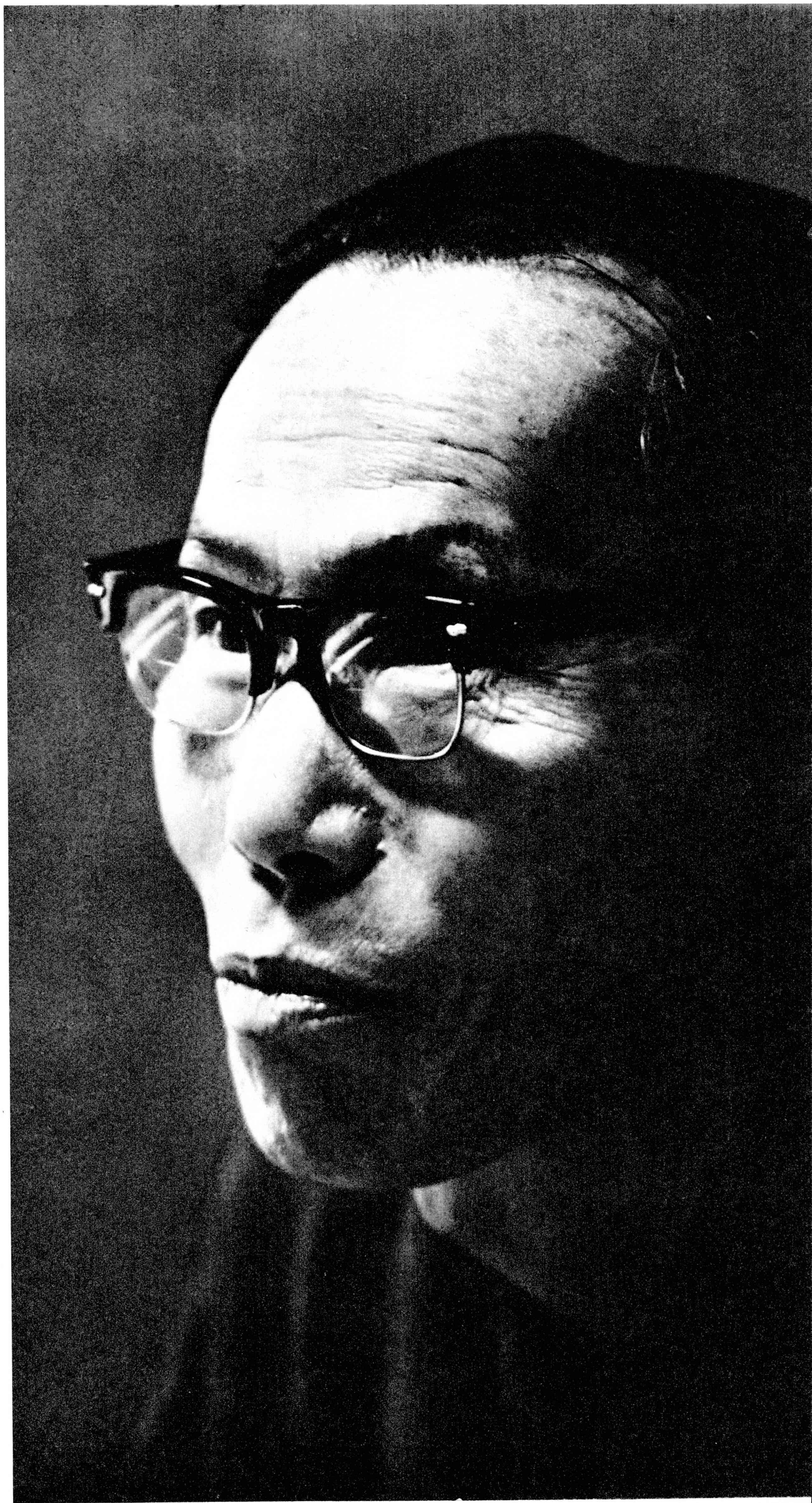
Lacquering is one of Japan's representative crafts preserved from ancient times, as shown by the English word "japan," which signifies lacquer. In 1955, Mr. Kodo Otomaru, 69, was designated by the Government as a "holder of an important intangible cultural asset"—or a "human national treasure." This was in recognition of his contribution to further developing the lacquering craft, handed down from generation to generation over more than 1,000 years, through numerous creative works of high artistic value.

There are various methods for making lacquer ware. But Mr. Otomaru makes a speciality of two techniques—namely, "choshitsu" (lacquer carving) and "tsuishitsu" (lacquer piling).

"Choshitsu" is a technique of carving lacquered articles. First, a receptacle—tea caddy and hand-box, for instance—is made of well-seasoned wood (cloth is also used sometimes). Then it is coated with lacquer many times so that layers, differing in color, are formed on the surface. Then after the lacquer has become fully hardened, patterns are carved on the lacquer surface, and the traces of the chisel reveal multicolored layers of lacquer, creating a unique beauty.

"Tsuishitsu," on the other hand, is the technique of making various vessels with lacquer alone without using wood or cloth as the base. First, a board of lacquer with a certain thickness is made by repeating lacquering hundreds of times. That is, the board consists of multicolored layers of lacquer. Assuming that a cylindrical vessel is made, a number of rings are cut out of the board and pasted together with lacquer to form the vessel. Lacquer, once hardened, is permanently durable unless artificially processed. But wood and cloth used as the base for lacquer ware decay or become deformed with the passage of time. In sharp contrast, lacquer ware made by the "tsuishitsu" process lasts for ever, since no material other than lacquer is used. This technique of binding together lacquer boards with lacquer is Mr. Otomaru's unique speciality and a very difficult technique which many lacquer craftsmen had tried in vain to master.

Continued on page 48





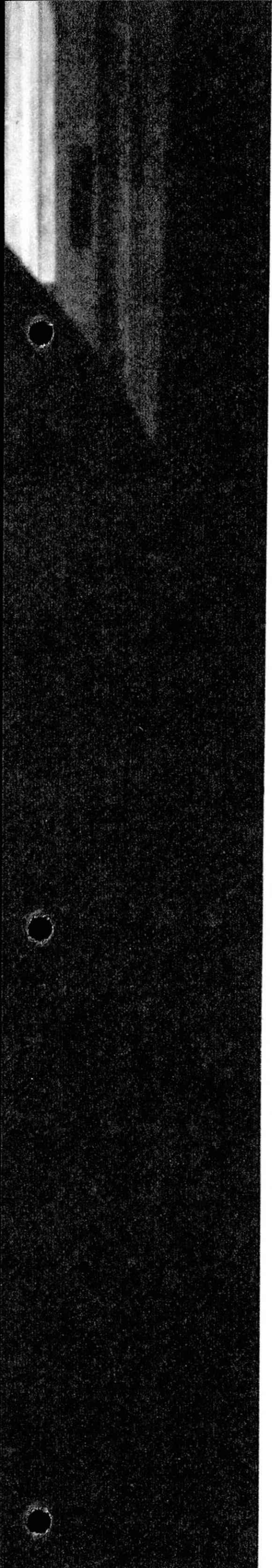
Kodo Otomaru at work.





Above: Mr. Otomaru enjoys tea with his family at his home in Tokyo. Right: Lacquering art requires a great deal of patience. As many as 100 coats of lacquer make a thickness of only 3 millimeters.







The traces of the chisel reveal multicolored layers of lacquer, creating a unique beauty.

Essentially, the craft of lacquering requires a great deal of patience, and this is particularly the case with Mr. Otomaru's techniques. As many as 100 coats of lacquer make a thickness of only 3 millimeters. For each coat must be thin, as a thick one prevents the lacquer from hardening. Moreover, a fresh coat must not be applied until after the previous coat has fully dried and hardened. Since lacquer takes a whole day to dry, 100 days are needed to repeat lacquer coating that number of times. Mr. Otomaru gives as many as 150 to 200 coats of lacquer to his works.

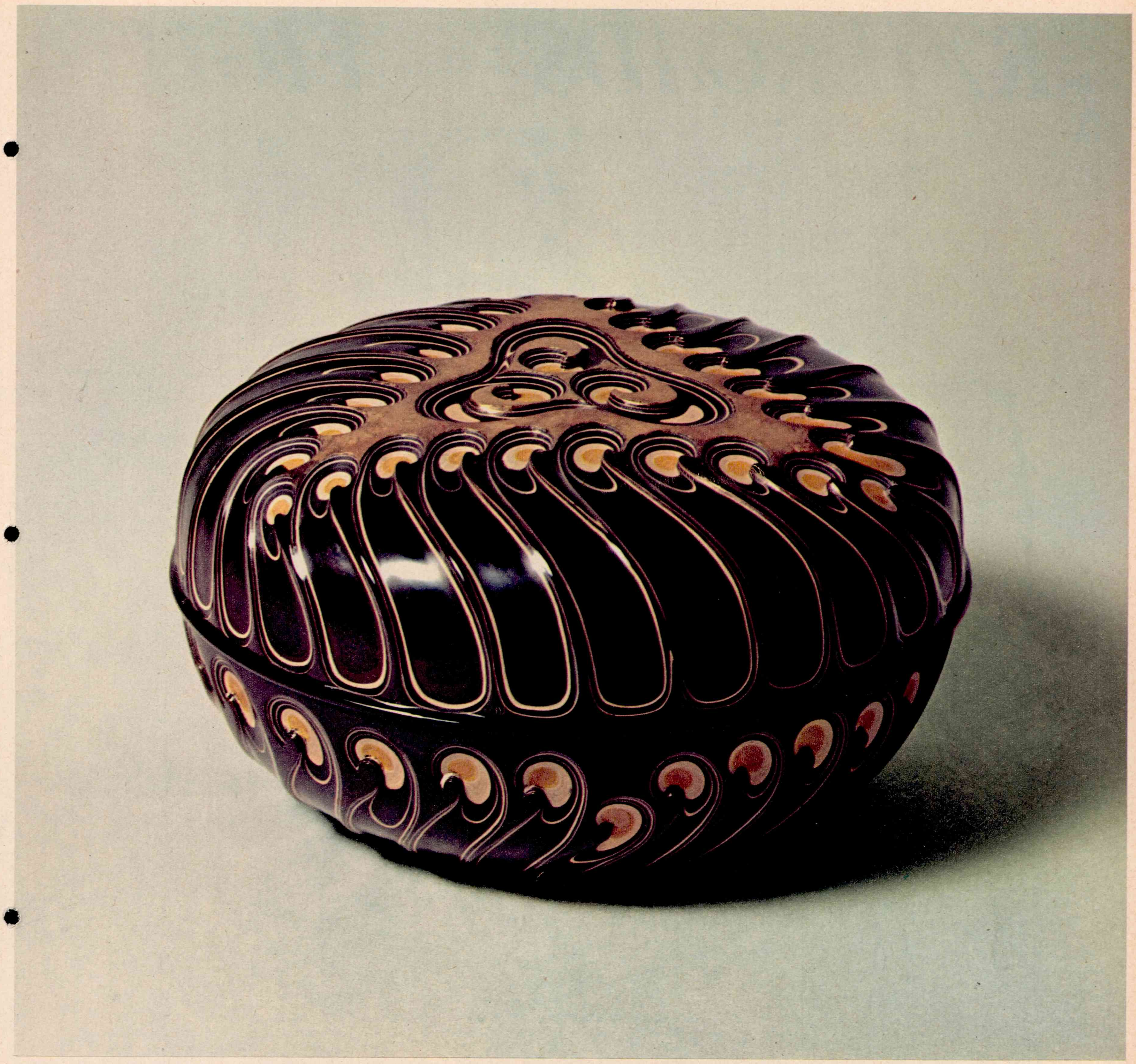
Mr. Otomaru grew up in a farming village in Kagawa Prefecture, Shikoku. Upon finishing primary school, he started to learn the lacquer techniques preserved in the area from olden times. But when he began forming an opinion of his own on the meaning of art at the age of 17 or 18, he could no longer remain satisfied with the mechanical work of making lacquer ware as souvenir items for tourists. Thus he made up his mind to express his artistic ideas through the medium of lacquer ware. For more than half a century since then, Mr. Otomaru has devoted his entire energy to the art of lacquering.

He is literally a self-taught artist without having ever been apprenticed to any particular master in his younger days. In retrospect, he said: "My masters were excellent lacquer works left by our ancient predecessors. Whenever I saw an exquisite masterpiece, a firm resolve to make better ones welled up in my mind. We cannot protect and preserve our tradition if we go no further than to make articles of the same artistic value as those left by our predecessors. It is only by a resolute determination to excel them and break through the framework of tradition that we can protect the tradition, I believe. With this spirit as principal prop, I have trod my path all along."

Lacquering art requires an enormous amount of patience and perseverance, although this is also the case with all other traditional crafts in a greater or less degree. Apart from the artistic value of lacquer works, it takes at least 10 years to acquire the skill of making ordinary lacquer ware. Nowadays, therefore, the number of those wishing to become lacquer craftsmen is on the constant decline, and a shortage of successors is a common trouble with lacquering experts. In this respect, however, Mr. Otomaru is really fortunate, since all of his three sons are skilled lacquer artists in their own right, who are known for their excellent works.



Most of Otomaru's works are utensils of tea cult. Right: Tea container made with "lacquer piling" technique. 6 centimeters in height.



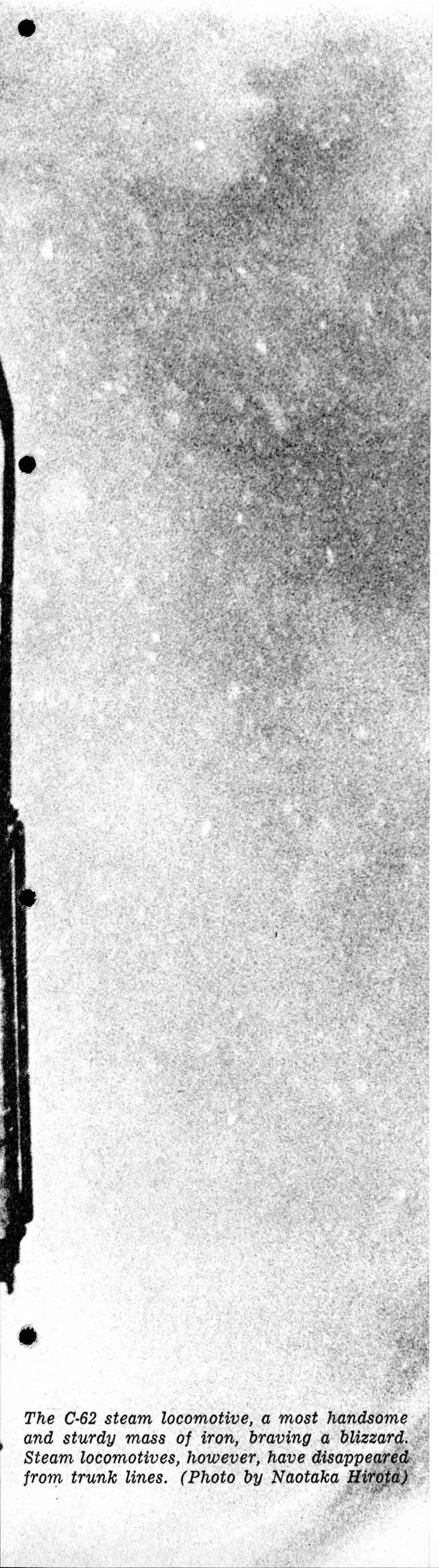


Kodo Otomaru's creations are noted for their refined luster and delicate shades of color peculiar to lacquer. Above: Tea container made with "lacquer carving" technique. 10 centimeters in diameter. Left: Incense container for tea ceremony made with "lacquer piling" technique. 4 centimeters in height.

RAILROADS' FIGHT



AGAINST SNOW



The C-62 steam locomotive, a most handsome and sturdy mass of iron, braving a blizzard. Steam locomotives, however, have disappeared from trunk lines. (Photo by Naotaka Hirota)

By Isao Sakai

Assistant to Manager, Transportation Museum

As autumn, which has tinged mountains with red and yellow, draws to a close late in November, news of the first snowfall arrives from northern districts and mountainous areas.

And the distribution of atmospheric pressure over and near Japan gradually assumes a wintry pattern of "Seiko Totei" (literally, west high, east low), making railwaymen busier and busier girding themselves for a hard fight against snow. In winter, a northwesterly seasonal wind sweeps through Japan every day as high atmospheric pressure stays over the continent to the west while low air pressure lingers over the Pacific Ocean to the east. The wind, chilled over the continent, fully absorbs moisture over a warm current in the Japan Sea and then blows snow to the Japanese archipelago.

It snows almost every day on the Japan Sea side of long ranges of mountains that form the backbone of the Japanese island chain, while clear weather and chilly winds persist on the Pacific side. And in the latter part of December, the wintry weather pattern takes a complete shape.

"300 millimeter snowfall between stations. Train schedule was disrupted. 50-minute delay expected." Every day, railway operation offices are swamped with such reports, and Russel snowplows, kept constantly in readiness, are ordered into action.

It snows heavily in Hokkaido and on the Japan Sea side of Honshu. Of the total length of Japan's railways, one-third runs through these areas. In particular, there are areas with records of more than 4-meter snowfalls in Akita, Yamagata, Niigata and Toyama Prefectures. Every winter, an aggregate of 850,000 men and a budget of 2,000 million yen are thrown into the railways' fight against snow to prevent the suspension of train services for even a single day.

Locomotives of trains running in snowy areas have snowplows in front, and so, can plow through snow up to 30 centimeters deep. But in case of deeper snow or sleety, sticky snow, special snowplows must be called into action.

TYPES OF SNOWPLOWS

RUSSEL SNOWPLOW: This is in greatest use. Equipped with a wedge-shaped blade and vertical wing and pushed by a locomotive, this snowplow operates in between train runs to thrust aside snow on the tracks. It cuts a 4.5-meter-wide swath. For passing over bridges or through tunnels, the Russel snowplow can close the wing with compressed air sent from the locomotive. The Russel snowplow for a single-track railroad thrusts snow to both sides, while that for double-track sections shoves snow to only one side. Altogether, there are 217 snowplows of this type in Japan at present. They can remove snow up to one meter in depth.

JORDAN SNOWPLOW: Capable of cutting a wide 7-meter swath it is used for removal of snow in spacious areas, such as marshaling yards and station compounds where many tracks run parallel. Pushed by a locomotive, the Jordan snowplow thrusts snow to one side with a large wing, which is spread with compressed air. Compared with the Russel snowplow, which operates in between train runs, this snowplow proceeds at a slow speed, and therefore, can remove deeper snow than is the case with the Russel snowplow. Today, 21 Jordan snowplows are in operation.

ROTARY SNOWPLOW: This is the most powerful snowplow capable of throwing snow up to three meters deep to a distance of 50 meters by rotating a big impeller with a diameter of 2.5 meters. It is also pushed by a locomotive like other snowplows, but has an internal structure similar to that of a locomotive, since it rotates the impeller on its own. The rotating direction of the impeller and the door of snow exit can be operated simultaneously so that the direction of snow throwing can be changed freely.

Guide wings in front of the impeller can be opened and shut. When opened to a maximum degree, they can guide snow up to 4.5 meters in width to the impeller, which has an ice breaking device for removal of snow even in case of snowslides.

MACKLEY'S SNOWPLOW: When snowy days continue and a Russel snowplow is used frequently, snow removed piles up to form high banks on both sides of the track. If this is allowed to continue, the rising banks would eventually leave no room for snow to be removed by the Russel snowplow. Therefore, during a letup in snowfall, Mackley's snowplow, pulled by a locomotive, is used to level the snow banks with wings, so designed to collect snow on both sides to the middle of the track. Then a rotary snowplow runs along the same track to hurl the snow, thus gathered, to a distance, so that the Russel snowplow can be used again.

This work during the period of heavy snowfall in winter is called L.M.R.L. (abbreviation of locomotive—Mackley's snowplow—rotary snowplow—locomotive). The abbreviation is used to signify snow removing work during heavy snowfall. Since Mackley's snowplow is thus used together with the rotary snowplow, the two types of snowplows in Japan now number 15 each to form pairs.



SNOW RODER CAR: The simplest snow removing method conceivable is to melt snow and discard the resultant water into a river. For snow, when melted, shrinks sharply in volume. The snow roder car has been manufactured on a trial basis to compress snow on the track, carry it via belt conveyor into the tank car, linked next to the roder car, and melt the snow by utilizing the heart of exhaust steam of the locomotive, which pushes the roder car and the tank car. The water is discarded into a river when the roder car passes over a bridge. Nevertheless, Japan, constituting a long chain of islands from north to south, has a large variety of snow, ranging from "dry" powdery snow to "wet" sleety snow, making it difficult to manufacture the snow roder car suitable for all types. At present, therefore, snow roder cars are used only to load snow-discarding trains with snowdrifts in the station compound.

NEW SNOWPLOWS

Snowplows, badly needed during the snowy season, are "white elephants" in other seasons. Large space is necessary just to keep store during nine months of the year, since they are used for only three winter months. To solve this dilemma, new diesel locomotives have been developed for snow-removing work.

DD14 DIESEL LOCOMOTIVE: This locomotive is active as a rotary snowplow in winter, but with the advent of spring, the snow-plowing section is disconnected and the locomotive is used for shunting work until the next winter. It is equipped with both the collecting wings and the revolving wing. Equipped with two engines, it not only can operate these wings, but also serves as a locomotive when the snow is light. One of the two engines is used to operate the wings, and the other for operation of the locomotive itself. But when snowfall is heavy, both engines are used to operate the wings, and the diesel locomotive is pushed by another locomotive. When used for shunting work, the locomotive is driven by both engines.

DD15 DIESEL LOCOMOTIVE: This is a self-propelled Russel snowplow equipped with double-track type snow removing devices both in front and in the rear. Like the DD14 model, it can be used for shunting during other seasons.

DD53 HEAVY DUTY ROTARY LOCOMOTIVE: This is a heavy duty version of the DD14 locomotive with a maximum speed of more than 85 kilometers per hour. During other seasons, it is usable for full-scale train service.

At present, eight DD14, 48 DD15 and two DD53 diesel locomotives are in service. In view of their excellent performance, conventional snowplows are expected to be replaced with new diesel types in the future.

Color page: This is the most powerful type of rotary snowplow capable of throwing snow up to 3 meters deep. (Photo by N. Hirota)

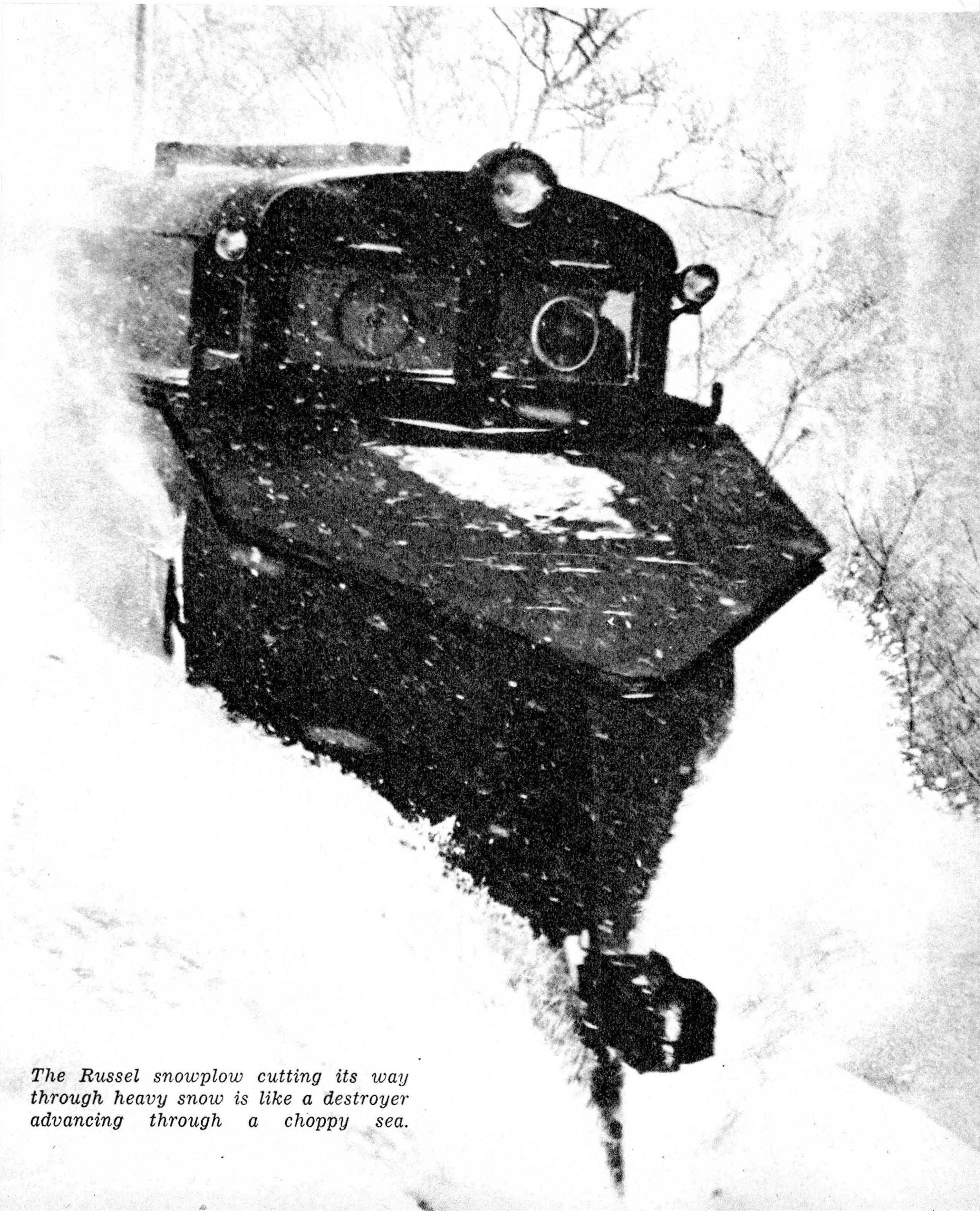
FOR ENJOYMENT OF WINTER

Toward mid-February, it starts getting warm, triggering snowslips in mountainous areas. A formidable snowslip two meters thick, 50 meters wide and 500 meters long, for instance, suddenly slides down a mountain slope with such tremendous force that railway tracks are swept away and bridges crushed in an instant.

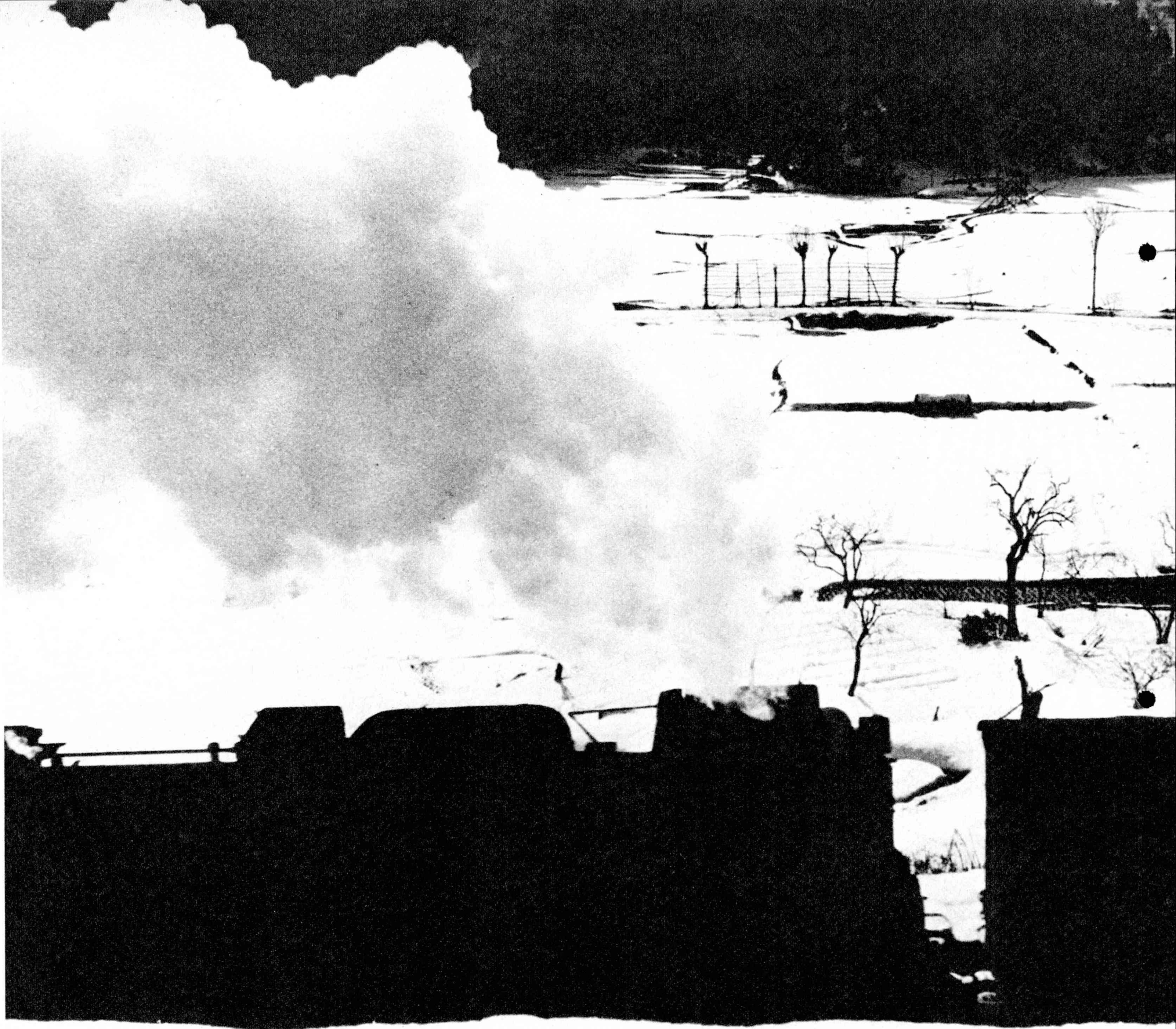
To prevent such damage, snow hurdles, baffle walls for deflecting snowslip or snowslide crackers are placed on mountain slopes beside railway tracks to stem snowslides, while snowslip sheds are installed to protect the tracks. In addition, snowbreaks and snow fences are seen at many places to prevent wind-swept snowdrifts from piling up on railway tracks. These anti-snow facilities are increased and reinforced throughout the year to protect railway tracks from snow damage.

For young men and women, it is an unforgettable experience to ski down snow-covered mountain slopes, and, undaunted by blizzard or severe cold, enjoy the pleasure of speed. Skating freely on a vast expanse of ice is also a major delight in winter. And year after year, the number of young people enjoying winter sports is on the rapid increase. Skiing grounds and skating rinks throughout the country are expanding and improving their facilities every year. But people enjoying the winter vacation must never forget about the railwaymen who work hard all the year round to keep railway services uninterrupted in winter, expand and reinforce snow protection facilities, keep snowplows in top condition and secure adequate numbers of snow-removing laborers.

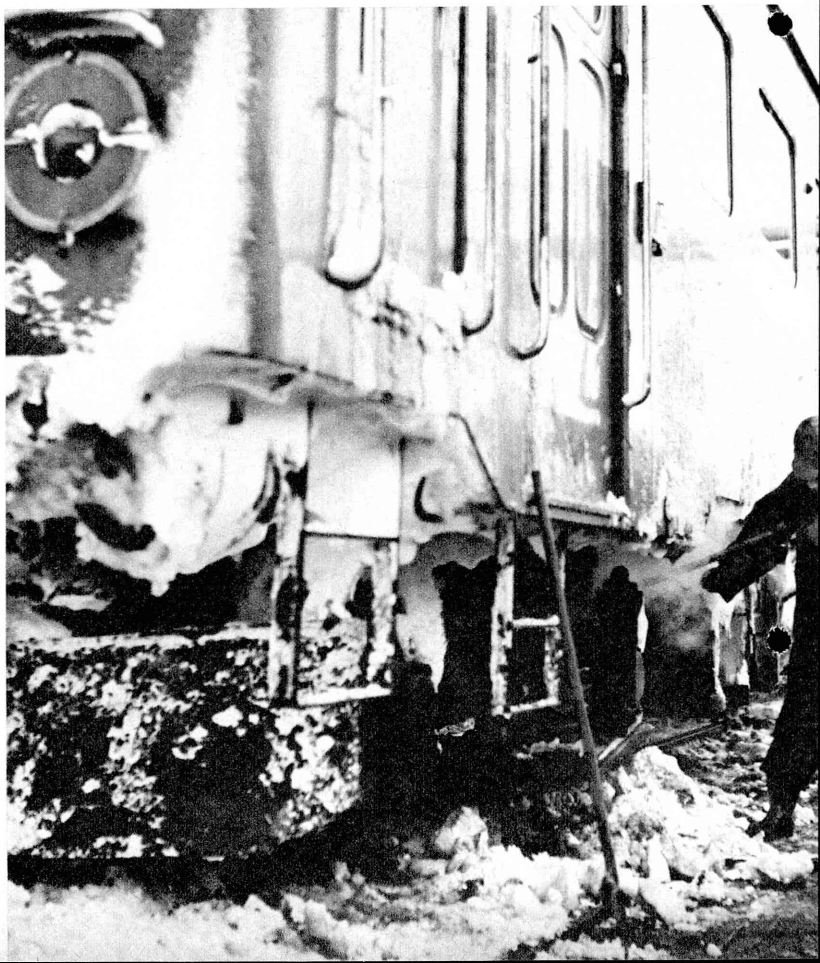
In the face of violent blizzard, track maintenance personnel keep vigilant watch over tracks in the dead of night despite a freezing temperatures of 40 degrees C. below zero, and stay wide awake in watch boxes to guard against snowslips. There are also large numbers of workers who are called out to engage in snow-removing work even during the year-end and New Year holidays. So we should never forget the great efforts of these people against General Snow to ensure comfortable and smooth travel during winter.



The Russel snowplow cutting its way through heavy snow is like a destroyer advancing through a choppy sea.







Above: The problem of keeping railway switches in smooth operation has been solved by the adoption of an electric device to melt snow. Right: Jet of steam removes frozen snow from a diesel car.



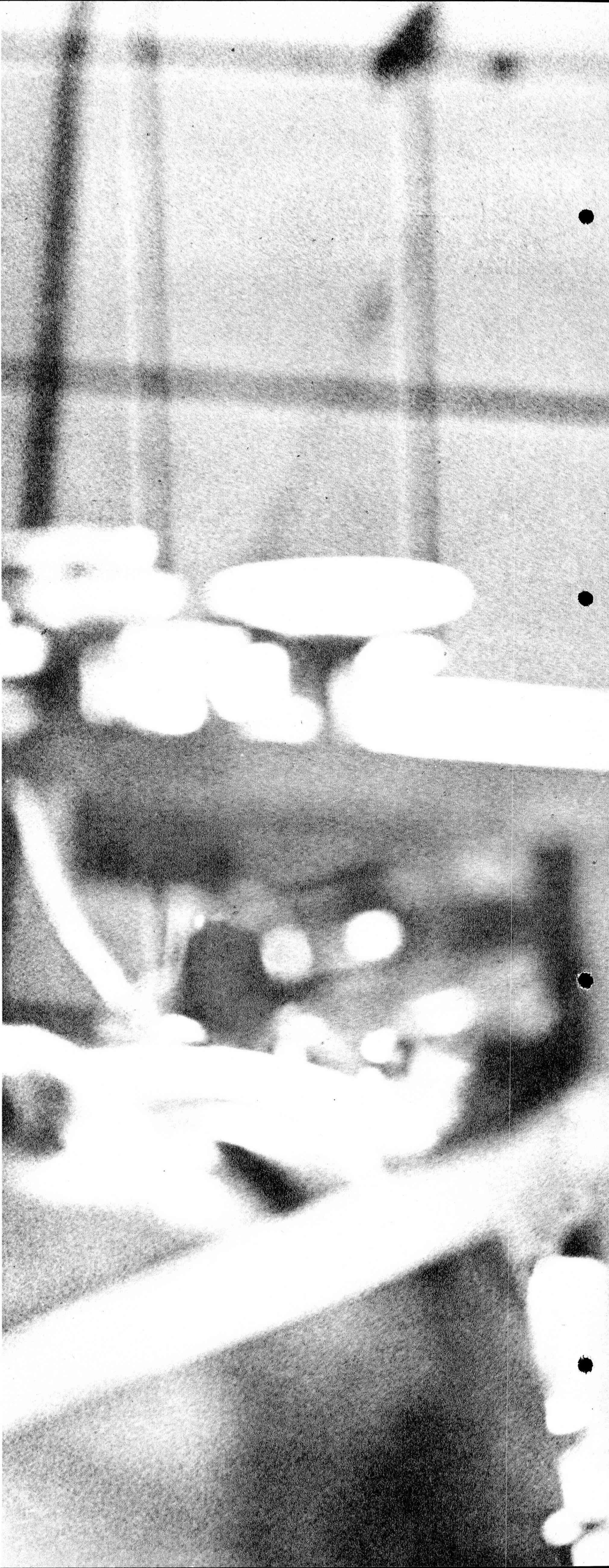


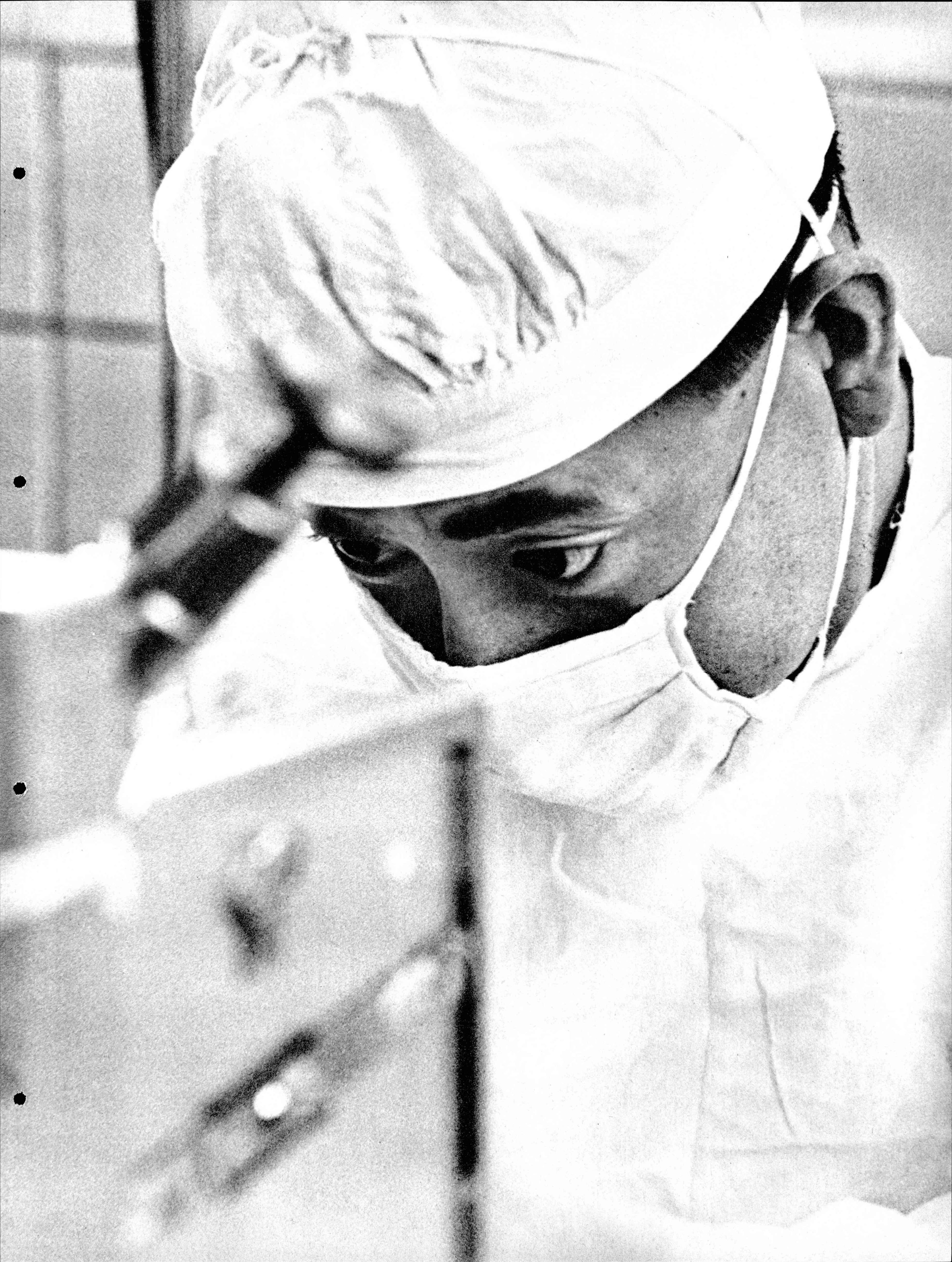
Track maintenance work, though largely mechanized, can hardly be perfect without the crew's affection for the railway.

Dr. Narabayashi's Neurological Clinic

World's Top Clinic For Cerebral Palsy

Dr. Narabayashi, a world-famed authority on "stereotaxic brain surgery," operates an elaborate apparatus for inserting a needle into the depths of the patient's brain. His sharp eyes are particularly impressive.





World's Top Clinic For Cerebral Palsy

"Dr. Narabayashi's Research Clinic for Nervous Diseases and Stereotaxy"—a white two-story building in a quiet residential area of Naka-Meguro, Tokyo—leads the van in the world's fight against cerebral palsy. Patients of this disease, formerly condemned by doctors—and even now believed incurable by many people—are being saved at the clinic by a difficult operation called "stereotaxic brain surgery." Thus far, they have had to become resigned to a miserable, bedridden life, which makes it impossible even to look after themselves. But the clinic has given them a chance to extricate themselves from such misery.

The clinic was founded in 1958 by Dr. Hirotaro Narabayashi, 45, professor at Juntendo Medical College and a world-famed authority on "stereotaxic brain surgery." Since then, he has performed such surgery upon as many as 1,500 patients, to give them hope for a new life. Among them were 70 foreign patients, who came all the way from such countries as the United States, Australia, India, Thailand and Czechoslovakia to undergo the operation.

And today, Dr. Narabayashi's challenge to the tragic illness still goes on at the clinic unremittingly.

Inside the operating room, you will notice the operating table on one side, and an array of electroencephalograph, small medical computer and other electronic apparatus on the opposite side. The room about 50 square meters is free of any "sanguinary" atmosphere usually associated with an operating room. Rather, it gives an impression of an electronic engineering laboratory. A patient under general anesthesia lies on the operating table, and several cords leading out of his head are linked with the electroencephalograph and other apparatus.

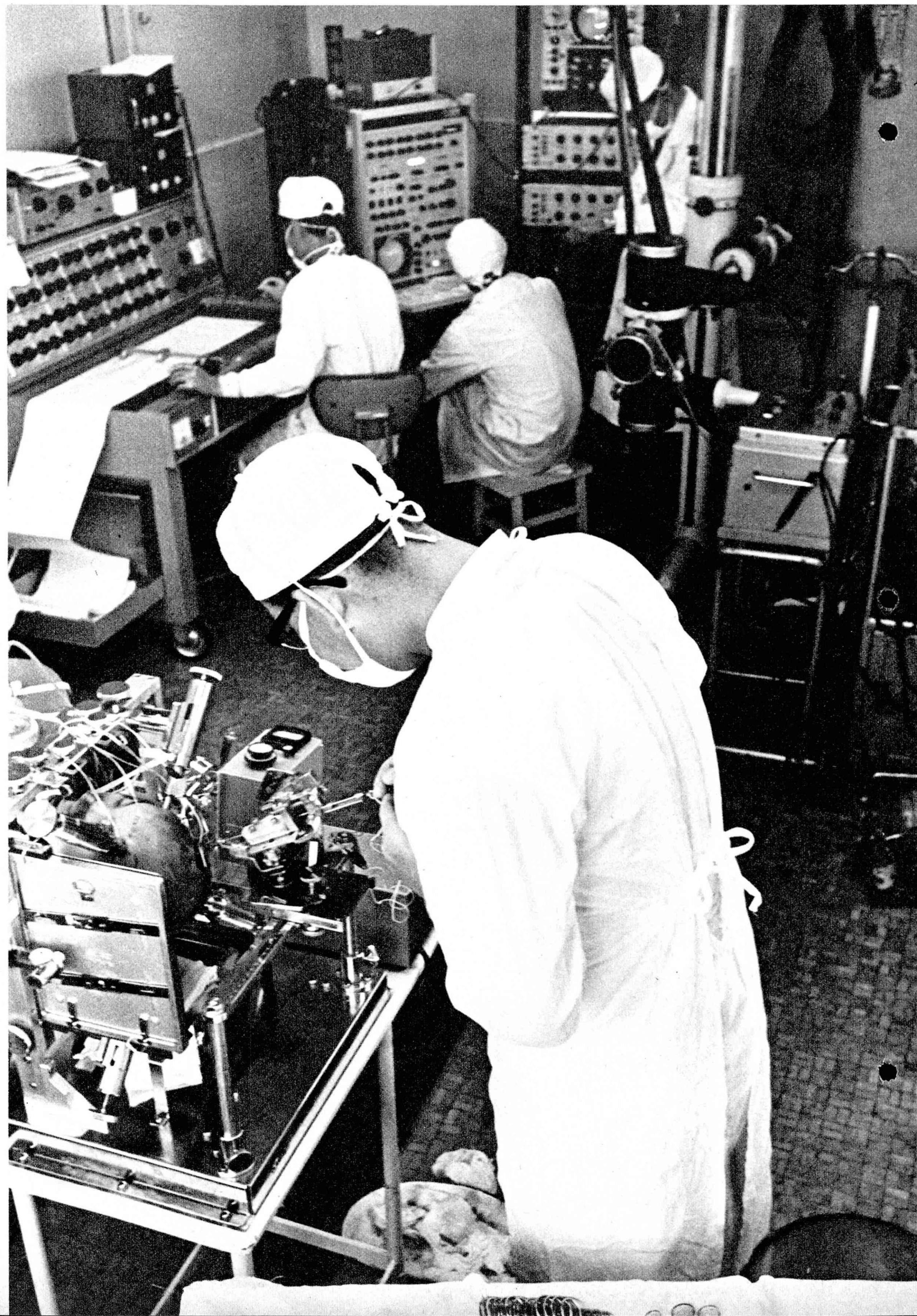
First, a small hole is drilled through the skull, and then a hollow, thin needle about 10 centimeters long is inserted through this hole into the depth structures of the brain. The patient's brain waves are incessantly shown by the electroencephalograph, and complicated blue lines fluctuate on the screens of picture tubes of electronic apparatus. Four assistants intently watch the apparatus, reading aloud the indicated data on changes in the depths of the brain. As the needle approaches the affected part of the brain, tension mounts. The eyes of Dr. Narabayashi, operating the device for needle insertion, become sharper and sharper. His finger tips move delicately. And their moves are known to all other assistant surgeons in the room in the form of changes in the data supplied through the electronic apparatus. Needle-operating Dr. Narabayashi and apparatus-watching assistants work virtually as a single man. It is splendid teamwork.

Now an X-ray picture is taken and promptly developed to examine if the needle is proceeding in the direction of the affected part. Not a single error in millimeters is permitted. Again, Dr. Narabayashi starts moving the needle. Finally, when it is confirmed by X-ray picture and data of electronic apparatus that the needle has precisely reached the affected portion, a medicine is injected through the hollow needle to destroy that part. The surgery starting at 11 a.m. ended shortly past 12 noon. All went smoothly and precisely.

Then what is cerebral palsy like? An encyclopedia gives the following definition: "Cerebral palsy is a condition characterized by paralysis, weakness, incoordination, involuntary motion, or any aberration of motor function caused by brain injury. The injury to the brain occurs most commonly at the time of birth, and may be the result of head trauma during the birth process, or of interference with the oxygen supply to the brain. Incompatibility of blood types of the mother and baby (the Rh factor) may also result in cerebral palsy. The degree of disability is dependent upon the site and amount of damage to the brain." (Encyclopedia Americana)

Dr. Narabayashi's surgery is designed to destroy those brain cells which are the basic cause of injury to motor functions, for the purpose of curing the muscle stiffness and involuntary motions of the body.

This surgical method is Dr. Narabayashi's own invention. Graduating from the medical department of Tokyo University in 1946, he started a life of medical research as assistant at the university infirmary. As a theme of study, he chose the clarification of the cause and mechanism of involuntary motions and muscle stiffness, which are symptoms of Parkinson's disease. He confirmed these symptoms could be cured by destroying affected cells in the depths of the brain. This



led him to invent the "stereotaxic brain surgery" for such kind of operation and develop a device to that end. He accomplished this around 1951 when Japan was still in the throes of recovering from war devastation with all commodities in short supply and foreign medical literature not yet available. At about the same time, similar studies to Dr. Narabayashi's were announced also in U.S.A., France, Germany and Sweden, although this did not become known in Japan until some time later. He improved his surgical method further to cure cerebral palsy, which has symptoms similar to those of Parkinson's disease.

The effect of the brain surgery is conspicuous, though differing according to the condition of the patient. For instance, a patient, thus far unable to hold a glass because of trembling hands, becomes capable of drinking water from a glass after the operation. A rehabilitative training can even makes him write characters. Moreover, the surgery can produce a wonderful result for the so-called "scissors gait" case. The patient of this illness is forced to lead an entirely bedridden, unfortunate life because one foot it fixed upon the other just like scissors. But Dr. Narabayashi's surgery even enables such a case to open feet and operate a wheelchair.

Dr. Narabayashi has been awarded several prizes in Japan in recognition of his great contributions to the curing of cerebral palsy through the development of an epoch-making surgical method. He has also been chosen honorary member of Société Française de Neurologie.

Two thick albums, placed on a bookshelf in the clinic director's room, are full of signatures of those doctors who have so far visited there and become deeply impressed with Dr. Narabayashi's brain surgery. The names, accompanied with messages or words of admiration, are written in various languages, such as English, German, French, Spanish and Chinese, as well as Japanese.

On the first page of the older album is a certain doctor's inscription: "May the clinic keep developing for the sake of medical progress and humanism." And the clinic has been on the constant march just as this doctor hoped. It has published a large amount of valuable data, while fostering several surgens capable of performing the difficult brain operation. In Sweden, meanwhile, a clinic modeled after Dr. Narabayashi's has been set up



Left: Operating room with an array of various electronic apparatus. Dr. Narabayashi is in the foreground. Above: Whether the needle has reached the affected part of the brain is confirmed through the X-ray pictures and data on the screens of electronic apparatus.

under the leadership of a Swedish doctor, who received training at the Japanese clinic. In Australia also, the construction of a similar clinic is planned. As the number of albums at Dr. Narabayashi's clinic increases to three and four in the future, more and more cerebral palsy patients will become able to benefit from his techniques.

Despite a marked progress in medical science, there is no decline in the number of cerebral palsy cases resulting from accidents in the process of birth. For the sake of these unfortunate people, Dr. Narabayashi is leading an extremely busy life every day simply according to the dictates of his conscience. Every Wednesday and Saturday, he performs surgery at the clinic. On other days, he engages in the examination of patients, lectures at his university and engages in medical experiments and research. And in between, he goes to hospitals in various parts of the country to give medical advice. He also attends many medical gatherings held both at home and abroad, and performs his duties as director of the International Society for Research in Stereoencephalotomy, Inc. with headquarters in Philadelphia, U.S.A. Furthermore, his clinic is swamped with letters from various parts of the world, expressing the desire to undergo operation in Japan. Therefore, the 14 beds of the clinic are constantly occupied.

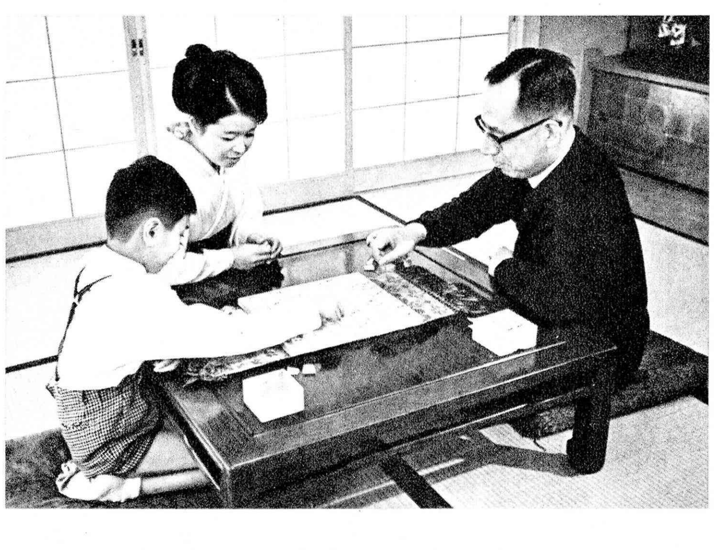
Dr. Narabayashi lives with his wife and a son, who attends primary school. His hobby is golf, but as he is too busy to practice, his golfing skill makes little progress, the doctor says. "Whenever my fellow professors hold a golf contest, I am the winner of the 'booby' prize, doing worst or next to worst," he said with a big laugh.



Below: Dr. Narabayashi studies medical literature at his room of Juntendo Medical College. He always has a cigar in his mouth.



Above: Dr. Narabayashi chats with his patients recuperating from surgery in the courtyard of his clinic. Peter Dovorsak from Czechoslovakia (2nd from left) was confined to bed before operation, unable even to sit on a chair. Right: The doctor enjoys playing Japanese chess with his son Yosuke and wife Atsuko at home. He is so busy that he has few opportunities for relaxation with his family.



Old Building of Imperial Hotel Ends 45 Glorious Years



Aerial view of F. L. Wright's masterpiece.

Tokyo is expanding with inexhaustible energy, and in the heart of the mammoth Metropolis, old buildings are being demolished every day to be replaced with ultramodern ones. Ferroconcrete buildings go up on the sites so far occupied by wooden structures, while 10-story buildings are being supplanted by still higher 30-story edifices. In this way, old buildings are being swept away one after another by a wave of demand for a more intensive use of land and a strong urge to seek greater profits through more functional buildings.

The old building of the Imperial Hotel, one of Tokyo's monumental landmarks, has also at long last been swallowed by this wave of the times. For about half a century, it has endeared itself not only to Japanese but also Western architects as a masterpiece of America's great architect, the late Frank Lloyd Wright, which represents a superb blending of Japanese and Western sentiments. Nevertheless, even this structure could not defeat the assertion that it must be replaced with a new "building more functional as a hotel." In the spring of last year, the management of the Imperial Hotel announced a plan to demolish the old two-story building and in its place, to build a 16-story hotel in time for the Japan World Exposition to be held in Osaka in 1970. It explained the old building had been already damaged beyond repair with cracks in walls and leaky roofs. As soon as the plan was disclosed, the "Society for the Preservation of the Imperial Hotel's Old Building" was organized mainly under the leadership of architects, and a campaign transcending national boundaries was launched to preserve the building. But even this movement failed to confute the hotel management's contention that "the artistic value of a building is meaningless unless it performs the function for which it is intended." For sponsors of the movement had no concrete measures for the preservation of the building and the collection of funds to that end.

However compromise was reached whereby only the main lobby of the historic structure will be removed to Meiji Village near Nagoya where numerous relics of the Meiji Era are preserved.

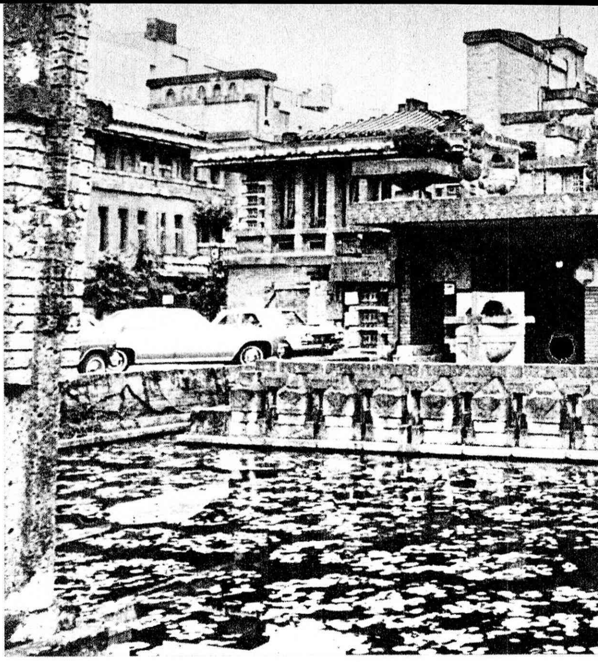
Thus the late Wright's masterpiece cutting a graceful, dark brown figure opposite the verdant Hibiya Park has finally disappeared. Nevertheless, this in no way erases the effects the masterpiece had upon modern architecture both at home and abroad as well as the role it played as a contact point between Japan and foreign nations and as a front stage of Japan's high society throughout its 45 years of life. These deserve to be recorded in the history of not only Japanese architecture but the nation's progress as a modern state.

The Imperial Hotel was opened to business as far back as 1890 when Japan was starting to walk the path of a modern industrial state steadfastly while positively assimilating Western technology and culture. It was built through the cooperation of business circles and the Government as Tokyo's first full-scale Western-style hotel for visiting foreigners. Therefore, the hotel virtually served as a sort of Government guest house from the outset. With the advent of the 1900's, there was a sharp increase in the number of prominent foreigners visiting this country, rendering it necessary to construct a new hotel building. And the designing of the new building and the supervision of construction work were entrusted to F. L. Wright, who had visited Japan before and had a deep attachment to Japanese culture. Construction began in 1917, and the new structure was completed in August 1923. Baron Kihachiro Okura, then operator of the Imperial Hotel, was not only a central figure in business circles, but known as an ardent lover of fine arts. Favored by the full understanding of this great man, Wright could give full play to his artistic talent, though far exceeding the planned period of construction work and the projected costs.

As ragards the design of the building, it is said, Wright remarked: "In a sense, hotel construction directly gives the measure of a country's culture. Therefore, a Japanese hotel must exude an atmosphere of Japan, and naturally, an architectural form matching Japan's geographical features is called for. In designing the new Imperial Hotel,, I have adopted the most strongly Oriental form." And his words were eloquently attested to by the new hotel building, which deftly utilized the unique touch of the *oyaishi* stones peculiar to Japan.

At 11:58 a.m. September 1, 1923, when a gala banquet commemorating the completion and opening of the new Imperial Hotel was about to start, Tokyo was stricken with the Great Kanto Earthquake, called the worst natural disaster in Japanese history. The banquet was naturally called off, but it was thanks to the earthquake that Wright's hotel building attained global fame. That is, although numerous buildings collapsed and were burned down, the Imperial Hotel remained undamaged, and not a single window pane was broken. "Hotel stands undamaged as monument to your genius. Hundreds of homeless provided by perfectly maintained service. Congratulations. Okura." This is the text of a telegram Baron Okura sent to Wright in reply to the latter's inquiry immediately after the earthquake.

The masterpiece of Wright served as a virtual guest house of Japan from 1923 to the early 1960's when new ultramodern hotels started to be built one after another on the occasion of the Tokyo Olympics. In the meantime, most foreign dignitaries visiting Japan put up at the Imperial Hotel. Since state guests and many foreign diplomats stayed at the hotel, it was said—with a bit of irony—that the "Imperial Hotel is a privately-managed Ministry of Foreign Affairs." Almost all businessmen, actors and actresses of world fame, who came to Japan, were cared for by this masterpiece of Wright.





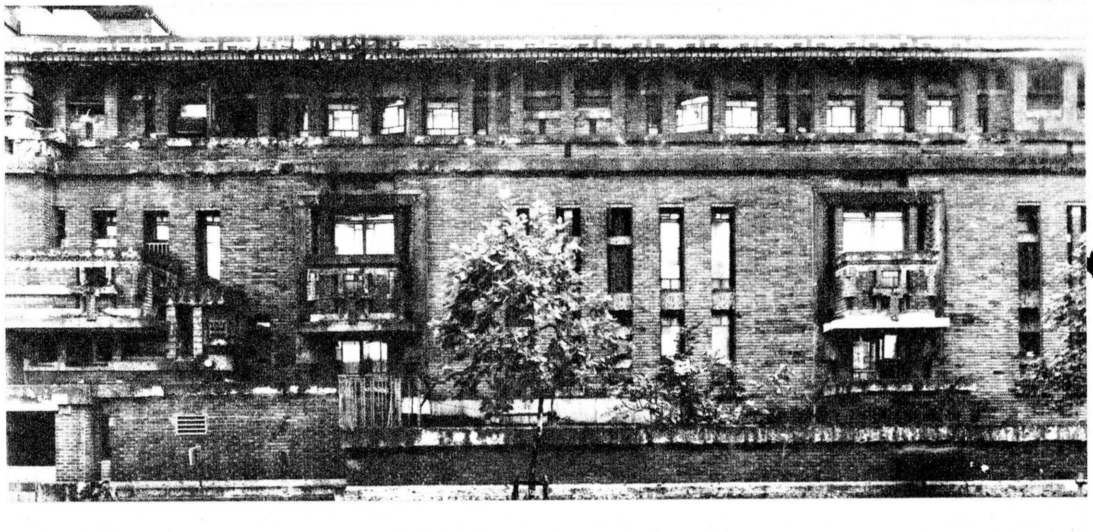
Virtual "Guest House" of Japan

When Charlie Chaplin stayed at the hotel in 1932, fans of this "king of comedians," eager to get a glimpse of him, filled the hotel lobby to overflowing, finally breaking window panes. A special police detachment was called out to keep the crowd under control. Helen Keller and Babe Ruth also put up at the hotel. Furthermore, the Peacock Room and other banquet halls of the hotel became representative meeting places for Japan's high society, and wedding receptions for members of noble families took place very often, providing colorful social topics.

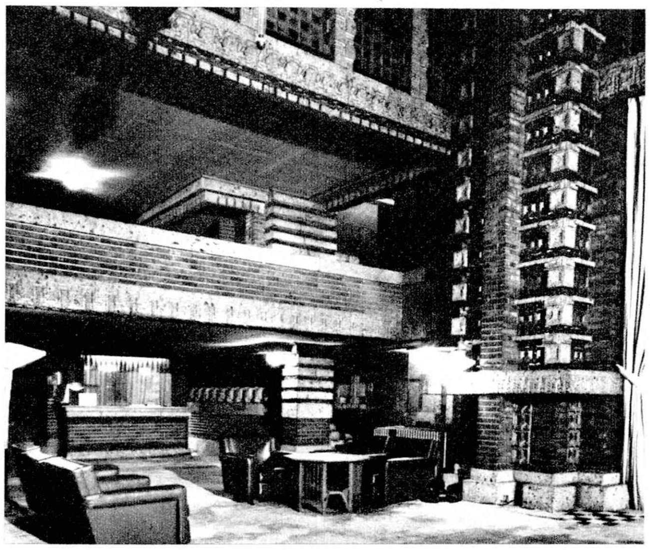
Then the Pacific War broke out. From late 1944, American air raids on Japan gathered full momentum, deepening signs of Japan's defeat. In the massive air raid of May 1945, the Imperial Hotel was finally hit by incendiary bombs, and the inside of banquet rooms and part of the southern wing were gutted by the resultant fire. After the end of the war in August of that year, the Imperial Hotel was requisitioned as living quarters for the top brass of the General Headquarters of the Occupation Forces. It was thus declared off limits to the Japanese public.

In March 1952, six years of requisition came to an end, enabling the hotel to resume normal business. In February 1954, Marilyn Monroe visited Japan, providing an amusing topic of conversation to the Japanese public, which still tended to be in low spirits. At the Imperial Hotel where she stayed, an uproarious

Above: Joe Dimaggio and his wife Marilyn Monroe wave to applauding fans from window of the old building of Imperial Hotel (February 1, 1954). Right: Side-view of the north wing.





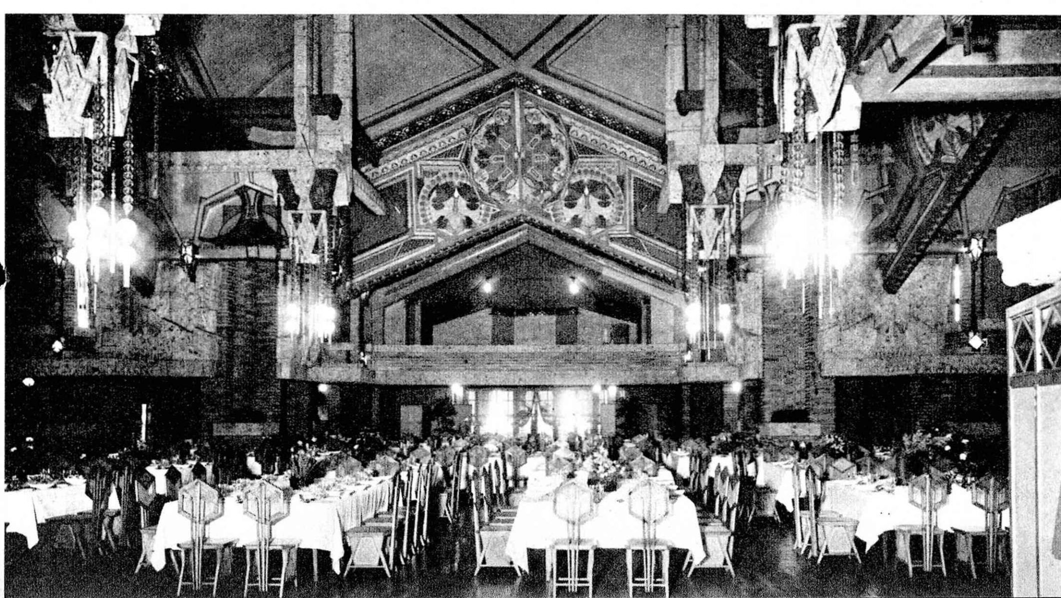


The natural beauty of "oyaishi" stones is given full play to enhance the artistic value of the building as a whole. Wright's concept of enlivening space with the beauty of building material itself conforms with a basic principle governing the structure of the Japanese house. Far left: Front view of the building. Left: Main lobby.

scene, which had marked Chaplin's prewar visit to this country, was re-acted by her enthusiastic fans anxious to catch a glimpse of the world-famed actress. Soon Japan's reconstruction started to make smooth progress. As this country walked a path of phenomenal economic growth, there was a steep rise in the number of foreign visitors, especially tourists. And the masterpiece of Wright must have been etched on their minds as one of the good recollections of Japan. In 1954, a new building was completed in the compound of the Imperial Hotel, and the Wright-designed structure, originally called the "new" building, started to be referred to as "old" building.

On November 30, 1967, the old building of the Imperial Hotel finally ended its 45 glorious years. But its last was worthy of its reputation as architectural masterpiece. That is, its demolition provided not only architects but also the general public with an opportunity to hold a thorough discussion on a number of important questions, such as the artistic value of architecture, meaning of urban beauty, and the desirable direction of urban redevelopment. An especially lively debate took place over how best to preserve architectural masterpieces in Japan with a relatively short history—that is, those built since the Meiji Era—like the old building of the Imperial Hotel. And it is highly significant that the discussion has served to heighten a mood among the Japanese people to evaluate Japan's modern architecture in a correct light and preserve architectural monuments of our times as legacy for posterity.





"Peacock Room" for banquet (left photo) and the hallway adjoining it (above photo). These pictures, taken before the building was damaged by an air raid, show the original design.

Tips On Shopping And Dining In Tokyo





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TOKYO 1968: ITS TWO FACES

THE JAPANESE SWORD: SECRETS OF ITS CHARM

1968·VOL.6·NO.2





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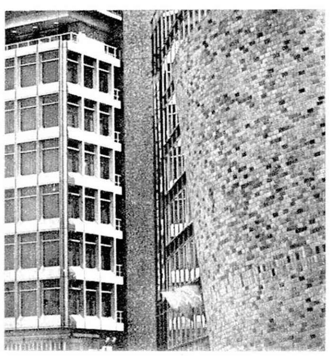
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Japan Illustrated

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Editorial Staff:
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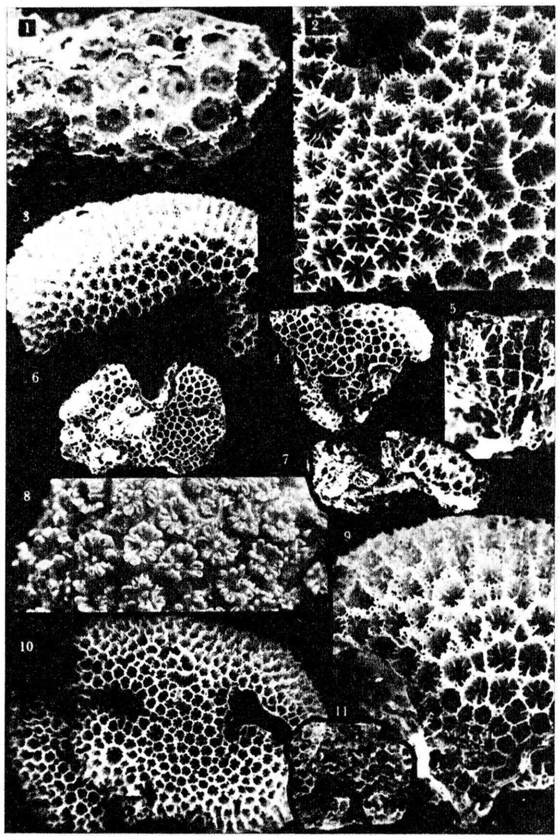
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Japanese Currents

NATURAL SCIENCE

Emperor Publishes His 9th Book



A page in the Emperor's book on corals.

A comprehensive study of corals, collected by the Emperor in Sagami Bay over a period of 40 years, will be published in book form on His Majesty's birthday or under the title "The Hydrocorals and Scleractnian Corals of Sagami Bay" (Edited by Biological Laboratory, Imperial Household; Collected by His Majesty the Emperor of Japan).

This is His Magesty's ninth book on biological researches and his fifth concerning creatures in Sagami Bay.

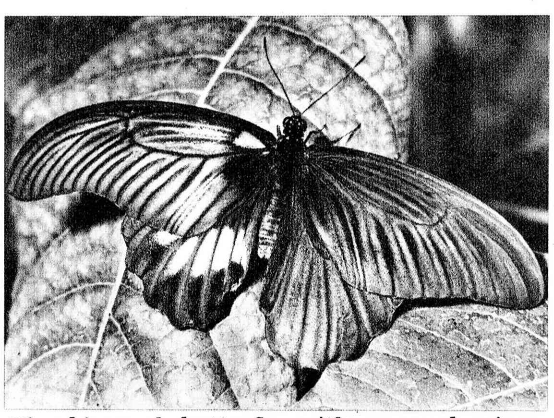
Corals being studied by the Emperor are different from what we generally imagine—that is, corals for personal ornaments. They are brittle corals which look like lumps of plaster, but they have great significance for clarifying calcium metabolism in sea water and its role in the formation of the earth's crust.

According to Prof. Motoki Eguchi of Tohoku University, who has written an explanation for the book, the corals mentioned include 13 species newly found by the Emperor—that is, four of the 22 hydrocorals and nine of the 85 scleractnian corals. The 382-page book size is 26 × 18 centimeters, contains 10 color plates and 60 black-and-white photos. Published by Maruzen in Tokyo, it is priced at 4,500 yen. The publication is limited to 1,500 copies, of which 1,250 will be sold to the general public and the remainder donated to research bodies both at home and abroad.

A Rare Hermaphrodite Butterfly

A rare bisexual among "Nagasaki Swallowtail" butterflies (a species living in the Kyushu and Shikoku regions in Japan) was recently born in the Entomological Garden in the Tama Zoo in Tokyo. This bisexual butterfly is about five centimeters in body length and about 13 centimeters wide with wings extended. Its size is normal. Its right wings, black in color, are those of a male butterfly, but its left wings with an orange-colored figure at the base of the forewing and five white stripes on the hind wing are those of a female.

The Entomological Garden has an insectarium that maintains such simulated natural conditions that 80 to 100 butterflies are flying about among the flowers at all times. The new "sex mosaic" is a third-generation descendant of "Nagasaki Swallowtail" brought to the garden from Kagoshima at the southern tip of Japan. It is the first example of its kind to be created through artificial incubation. Mr. Minoru Yajima, chief of the Entomological Division, says: "It is indeed a freak of God!"



The bisexual butterfly with unusual wings.

MEDICAL ELECTRONICS

Color TV System for Retina Developed



An operation with new color TV system.

A color television system to photograph the fundus of the eyes has been developed for the first time in the world through the joint effort of the Victor Co. of Japan and the Olympus Optical Co.

A black-and-white TV system to examine the retina had earlier been developed. But the invention of a color TV device to observe delicate changes in retinal color at first hand is of great significance for medical diagnosis. The fundus of the eye is the only place in the human body where an artery can be observed from the outside with the naked eye. To avoid using strong illumination, which is damaging to the eye, the new color TV system emits pulses of red, blue and green colors one after another, and then catches their reflections from the fundus of the eye to form a clear retinal image on the TV screen.

This device makes it possible to observe the delicate pulsation of blood vessels and other conditions of the fundus of the eye, thereby facilitating ophthalmological surgery and the early discovery of arteriosclerosis and dia-

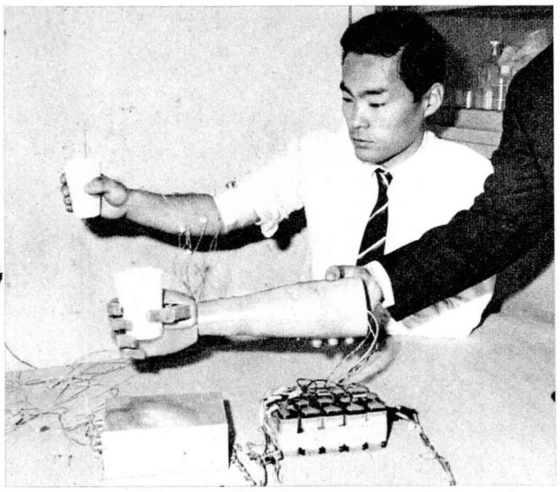
betes. Moreover, since the retinal state can be observed by many people at the same time, the new system not only increases the accuracy of diagnosis, but also contributes greatly to medical education and research.

Elaborate "Second Hand"

People who have lost hands or feet through illness or accident are naturally anxious to recover them. Thus far, however, artificial hands have been nothing more than "cosmetic gloves" for ornamental purpose or unsightly instruments with hooks. In response to physically handicapped people's longing to have hands they can move like real ones, Waseda Hand No. 4 (as shown by photo) has been developed for clinical experiments.

The new artificial hand, covered with polyester weighs 900 grams or about the same as that of the human forearm. When electric terminals of the device are attached to the skin, a person can open and close the fingers, grip a cup and turn the wrist, even if the forearm has been amputated. If only muscles are preserved to a certain extent, electric terminals can be fixed to the skin to catch muscular electric potential (electricity that occurs in synapse when muscles move).

The new device has a striking advantage in that it has a tactile sense. That is, tactile elements made of urethane foam are attached to the finger tips and linked by carbon with electric conductivity buried in the artificial hand. When a thing is gripped, the intensity of pressure sensation is changed into a fluctuation of electric pressure and conducted to suckers fixed to the skin. This is a unique mechanism without parallel in the world.



The "second hand" obeys mascular orders.

On the basis of clinical experiments with Waseda Hand No. 4, Prof. Ichiro Kato of the Science and Engineering Faculty of Waseda University, the inventor of the new hand, plans to replace the two motors of the device with pneumatic artificial muscles with a view to eliminating the sound of motors and reducing weight. He says the new system will not only meet the needs of persons, who have lost hands, but also serve as auxiliary equipment for hands that no longer function as a result of paralysis or lesion of nerves.

VENDING MACHINE

"Oxygen for Sale"



"Pure Air" attracts ramblers on Ginza.

In Japan, automatic vending machines have spread like wildfire. These automatic machines now sell *sushi* (rice cake topped with raw fish), confectionery, soft drinks, *oshibori* (hand-wiping towel), socks and nylon raincoats, to say nothing of tickets and tobacco. There have been emerged vendors for car washing, depositing money and borrowing cash. And the latest addition—perhaps without parallel in the world—to this growing list of vendors is the "Automatic Oxygen Vendor," installed in the basement of the Sony Building, a new ultramodern landmark of Ginza Street, a world-famed shopping center in smog-plagued central Tokyo.

Surrounded by many curious onlookers, customers are gladly inhaling oxygen one after another, such as middle-aged men enjoying a "puff" at the machine and office girls eager to beautify their skin with oxygen during lunch break. The charge: 50 yen per minute. A tonic cheaper than a cup of coffee?

CAMERA

World's First Fluorite Lens

The Canon Camera Co. has succeeded in developing the world's first commercial basis fluorite lens.

Until now, the application of fluorite and other crystals to an optical element of photographic lenses has been an extremely difficult and costly business. Previously it has only been used in microscopes or special lenses used in research work. Overcoming such difficulties, Canon's engineers have succeeded in developing a fluorite lens having a faster speed and longer focal length within reasonable cost limits. (Domestic price will be ¥200,000.)

With a focal length of 500 mm, the new FL-F 500 F5.6 lens features high resolution and contrast far exceeding conventional lenses using ordinary optical glass. It ensures complete correction of chromatic aberration, while resolution remains at 100 lines/mm even at the extreme edges. In addition to its excellent delineation power, the lens is compact and light, about 40 per cent shorter, 30 per cent lighter than normal 500 mm telelenses, thus making hand-held shots very easy.

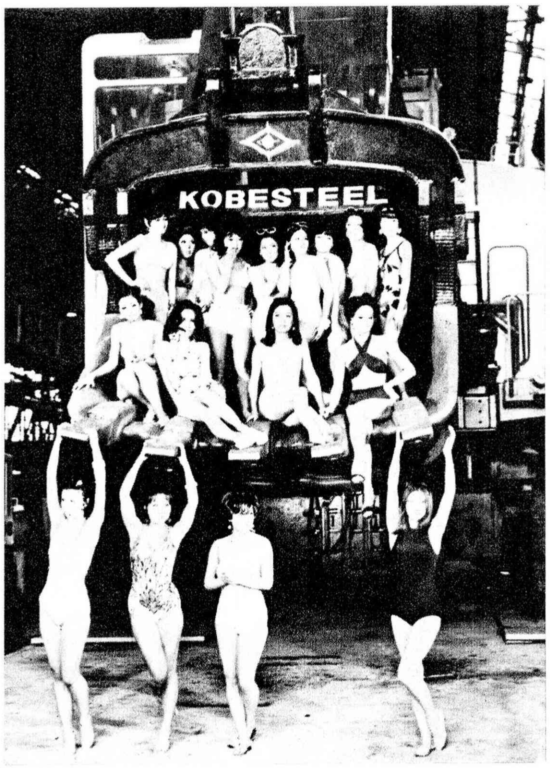


New fluorite lens, with excellent delineation power, makes hand-held shots quite easy.

INDUSTRY

Mammoth Power Shovel

A mammoth power shovel capable of lifting as many as 17 girls has been completed at the Okubo Plant of the Kobe Steel Ltd. ordered by an Australian mining firm. The giant shovel for use at an iron mine can scoop up 7.7 cubic meters of ores at a time. Its weight is 330 tons or equivalent to 330 ordinary passenger cars combined. The operator's cab is seven meters above the ground. The shovel is priced at 175 million yen. Incidentally, you might wonder what a bevy of pretty models in swimsuits has to do with the mammoth shovel. "Well, we just wanted to give you a general idea of how large the shovel is," said the maker, who invited reporters and cameramen to an unveiling ceremony.



Imagine what's happened to the beauties!

World's First Radio-Controlled Bulldozer

The Komatsu Mfg. Co., Japan's largest maker of bulldozers, has recently succeeded in developing the world's first radio-controlled driverless bulldozer for practical use.

The No. 1 machine, unveiled recently, is a large-sized bulldozer with a weight of 31.7 tons and a 250-horsepower engine. On the upper right side of the body, it has a radio receiving device the size of a trunk. The operator is equipped with a control box (weight: 1.6 kilograms) and a radio transmitter (2.9 kilograms), which are either slung from the shoulder or placed on the ground. (A Nickel cadmium battery is used.) The operator's instructions, given by a switch, are delivered by FM (frequency modulation) wave from the transmitter to the receiver, freely moving the bulldozer by means of compressed air. Radio control is possible within a distance of 100 meters and capable of handling about 20 kinds of instructions, including two-stage forward and one-stage backward moves. The No. 1 machine is already used at the Sakai Works of the Yawata Iron and Steel Co. in northern Kyushu.



Newly developed bulldozer is operated freely by radio control of the standing man.

World's Biggest Tanker Launched

The world's biggest tanker with a tonnage of 312,000 was launched at a dockyard of the Ishikawajima-Harima Heavy Industries Co. in Yokohama late last March.

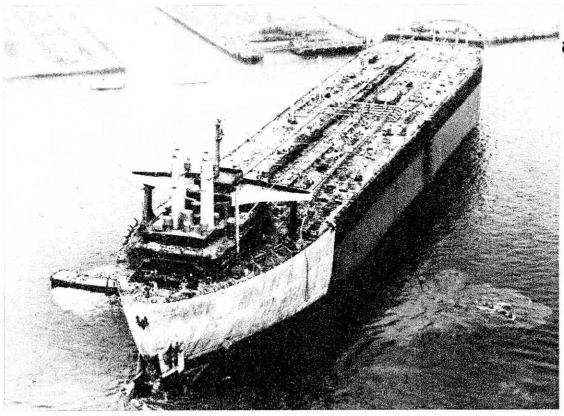
In recent years, the construction of tankers has been characterized by a pronounced tendency to build bigger and bigger vessels as a means of cutting the transport cost of crude oil. And in a short span of about two years, Japan has rewritten the record of the "world's largest ship" one after another, starting with the 151,000-ton Tokyo Maru (launched in January 1966) followed by the 210,000-ton Idemitsu Maru (December 1966).

The latest mammoth tanker is one of a total of six of the same tonnage ordered by the National Bulk Carriers of the United States from two Japanese shipbuilders—namely, three each from Ishikawajima-Harima Heavy Industries and the Mitsubishi Heavy Industries Ltd.

The giant tanker, measuring 346 meters in length and 53.3 meters in width, has a vast deck extending over 16,300 square meters. It is capable of carrying 350,000 kiloliters of crude oil (enough to fill 1,700,000 drums) at a time. The tanker is twin screw, and the crew's living quarters are fireproof.

Fitting-out, painting, machinery adjustment and test runs will be completed by the end of August. After that, it will shuttle between Kuwait and an oil storage base on Ireland via the Cape of Good Hope, for it is too big to pass the Suez Canal.

Incidentally, the Tokyo Tanker Co. has made inquiries to several Japanese shipbuilders for construction of 380,000-deadweight-ton tankers. Meanwhile, intensive research is in progress at Japanese shipyards to build 500,000-ton vessels. Thus indications are that it will not be long before the record of the "world's biggest ship" is renewed again.



The tanker measures 346 meters in length.

FIRE FIGHTING

Fire from Oil Heaters Can Be Quenched by Water

When oil catches fire, pouring water on it merely fans the flames. So when an oil heater is knocked over and flares up, don't pour water, but spread a blanket or bedding to choke off the fire.

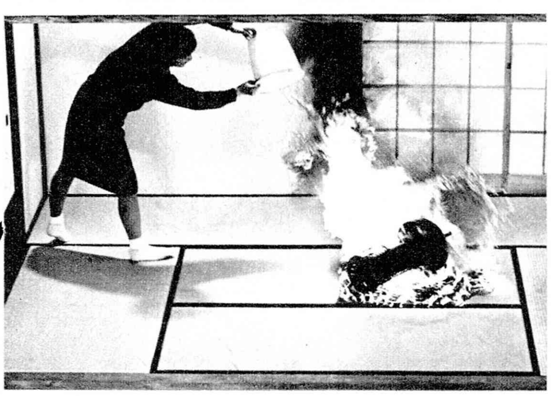
This is what has been generally believed by the public. Yet the "Kurashi no Techo" (Guide to Living), an authoritative magazine providing knowledge and information condu-

cive to a rationalization of home life, has recently come up with the outcome of its own fire-fighting experiments that squarely contradicts the commonly accepted theory. (This magazine is a unique periodical, which refuses to carry any advertisement whatever, with a view to maintaining a just and fair stand for the benefit of the public.)

The staff of the magazine even bought a house for fire-fighting experiments and repeated elaborate tests to find the best means of putting out a fire from an oil heater. The conclusion emerging from the experiments is summed up as follows:

"A fire from an oil heater, especially in its initial stage, can be extinguished by water. Even after oil leaking from the heater catches fire with flames rising one to 1.2 meters from the floor, one bucketful of water (about six liters) can put out the blaze if the heater is placed directly on the *tatami* (mat) floor. In the case of a wooden floor, two bucketfuls of water suffice to quench the fire completely. In both cases, however, the water must be poured directly from above. So if an oil heater is knocked over, touching off a fire, let us lose no time in pouring water over it from a bucket."

This recommendation, published in the magazine's early spring issue of 1968, clashed head-on with the advice by the Metropolitan Fire Department to just throw a blanket over the fire. But both sides stood to their guns. And this dispute got all the more vociferous since mass communications media gave it great prominence. Finally, the Fire Defense Agency of the Home Affairs Ministry decided to stage a public experiment to render conclusive judgment on the matter.



A bucket of water can put out the blaze when directly poured in a few minutes.

After the test, the Agency advised the general public to "keep a bucket of water near an oil heater at all times," virtually adopting the view of the "Kurashi no Techo" to a great extent, although the Agency prefaced its announcement by a cautious statement that "it is impossible to decide simply which is the more effective, because of differences in various conditions, such as the type of oil heater and individuals involved."

TOURISM

Japanese Make Tours Abroad

Japan has become a major tourist center with foreigners arriving in increasing numbers year after year to see Japan's natural beauties and cultural heritage. On the other hand, there has also been a steep climb in the number of Japanese tourists going abroad.

Last year, Japanese nationals traveling abroad numbered 427,000, exceeding the 400,000 mark for the first time. This represented a jump of 25 per cent over 1966. And most of them were tourists, although there was also an increase in those going abroad on business or for study. This bears testimony to a marked rise in the Japanese people's standard of living.

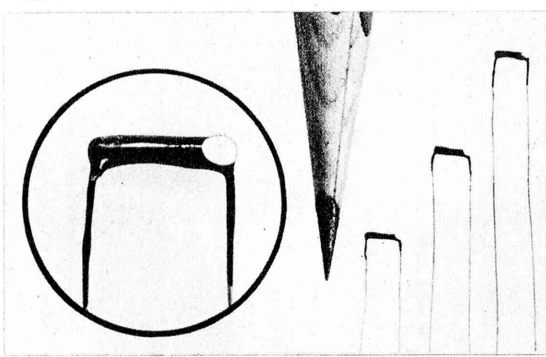
The greater part of Japanese travelers go to Hongkong and Taiwan. Among them are middle-aged couples traveling to celebrate their silver weddings and many office girls who have saved twice-a-year bonuses to make their "dream of an overseas trip" come true. There has also been an increase in newly-wed couples going to the "Islands of Unending Summer" Hawaii for their honeymoon. Tourist agents have prepared a rich variety of tours, including a 700,000 to one million-yen journey to Europe.

TV commercials keep telling you: "Your seats are reserved for London, Berlin, Paris and everywhere else." This may tempt one, even a poor linguist, to join a group tour, accompanied by interpreters. By and large, foreign tourists coming to Japan keep their purse strings tight, apparently because they have saved their expenses for overseas travel for many years. By contrast, souvenir goods sellers abroad are agreed that Japanese tourists spend liberally.

As a result, Japan's balance of payments in the sphere of tourism is largely in the red. Moreover, the United States, the biggest source of tourists, has tightened restrictions on overseas travel as part of its effort to improve the balance of payments position and defend the value of the dollar. As Japan's balance of payments picture is far from bright at the moment, Transport Minister Yasuhiro Nakasone has finally issued a statement urging Japanese to refrain from overseas trips as far as possible.

TECHNOLOGY

Sony Unveils New Semiconductor



Elements of SMD (as enlarged in circle) are compared with a pencil point.

The Sony Corporation recently announced the successful development of a new semiconductor element highly sensitive to magnetism, called Sony Magnetodiode (SMD), producing widespread repercussions in the world's electronic industry.

SMD's epochal characteristic—that is, control of electric current by means of magnetism —is applicable to a virtually unbounded scope of fields ranging from electric home appliances to the attitude control of rockets. Moreover, because of its simple structure, its price is very low and the production process involves no difficulty whatsoever.

The mention of Sony recalled to our minds the success of the same company more than 10 years ago in the practical application of transistor to apparatus for home use, destroying the common belief at the time that transistors could be used only for industrial purposes. This, it is remembered, greatly reduced the size of radios, TV sets and tape recorders, totally changing the image of electric apparatus for home use. The consensus of opinion in academic and industrial circles is said to be that the newly developed SMD has a far greater value than all of Sony's past achievements put together.

SMD is a three to five-millimeter semiconductor made of germanium. If electric current is made to flow in a circuit containing SMD, it can be strengthened, weakened or stopped by merely bringing a magnet close to it. Moreover, it is not necessary to have the magnet directly contact the semiconductor. That is, you can turn a TV set on or off, and adjust the sound volume by simply bringing a magnet near the switch. The characteristic of "no contact" eliminates such troubles as occurrence of sparks, wear of metallic parts and noise. The scope of its practical applications appears unlimited, ranging from non-contact switch, non-contact sound volume control, and a brushless motor to automation circuits with built-in magnets, automobiles without engine, and attitude and direction control of rockets.

Simultaneously with the announcement of SMD, Sony filed applications for patents and utility models, totaling upward of 100 cases. Already, many novel apparatus using SMD on an experimental basis are displayed in Sony's showroom.

It is said that basic techniques for production of SMD were completed more than two years ago. This means that Sony has since been devoting its full energies to applying the new semiconductor to practical uses. Another is obviously because of a bitter experience regarding outstanding Sony invention—Esaki Diode—9 years ago. That is, although Sony developed basic techniques for the Esaki Diode, American firms stole a march on Sony in taking out patents for practical applications of the diode.

CULTURAL EXCHANGE

"Bunraku" Troupe Goes to Europe

Bunraku, a puppet show and one of the nation's traditional theatrical arts from olden times, will be featured in the two-week opening presentation of "Le Théâtre de Nations," an international festival of the theater in Paris beginning April 29 this year. This is a gala spring festival of dramas in Europe and its curtain-raising ceremony is personally attended by the President of France. The *bunraku* troupe is the first Japanese theatrical group ever to perform at the festival.



The living dolls on the Bunraku stage.

The *bunraku* troupe made a performance tour of the United States twice—in 1962 and 1966. In particular, its performance in New York in 1966 caught on with tremendous success. The forthcoming Paris performance of *bunraku* owes a great deal to Mr. Jean Louis Barrault, who was fascinated by the *bunraku* drama when he came to Japan several years ago, and has since been in close contact with the Bunraku Association. He is the leader of the Théâtre de l'Odéon in Paris, which is the site of the theatrical festival.

A variety of stage settings, weighing 20 tons, has been sent to Paris to make up the stage of the traditional *bunraku* theater so that the Europeans may appreciate *bunraku* to the fullest extent. The *bunraku* troupe going to Paris will consist of 34 members, including Monjuro Kiritake, and Tsudayu Takemoto, both designated as "living national treasures" by the Government and other musical instrument players.

In addition to the Paris performance from April 29 to May 11, the troupe will take part in the World Theater Season at the Old Vic Theater in London June 10-22. Performances in other parts of Europe are also planned in response to invitations from a number of countries. Main schedules include an appearance at the Akademie der Künste in Berlin, and at Teatro Lirico in Milan. The delicate expressions and movements of the puppets, manipulated to the accompaniment of *gidayu* chanting and *samisen* (a stringed instrument) music, are bound to give fresh stimulus to the threatrical world of Europe.

TAIZO ISHIZAKA

BUSINESS TYCOON DIRECTING EXPO '70

"The theme of 'Progress and Harmony for Mankind' has been hoisted for EXPO '70. So we shall see to it that visitors from all over the world will enjoy friendly interchanges with one another so that all of them may say, 'we are really pleased to have come to the exposition. It's truly significant.' To that end, we are resolved to make EXPO '70 a grand, substantial event that will go down as a shining milestone in the history of world expositions," says Mr. Ishizaka, president of the Japan Association for the 1970 World Exposition. As he speaks, his face wears such a vigorous expression that no one could possibly presume him to be so old as eighty-one.





The Japan World Exposition, Osaka, 1970 (EXPO '70) will be held at the Senri Hills, Osaka, for 183 days from March 15 through September 13, 1970. Mr. Taizo Ishizaka has been appointed president of the Japan Association for the 1970 World Exposition, and is in charge of preparing and administering the first full-scale world fair in Asia.

Born in Tokyo in 1886, Mr. Ishizaka, now 81, is the veritable doyen of Japan's economic world. His present titles as president, chairman, chief director, adviser and the like number as many as 300, including the presidency of the Federation of Economic Organizations (Keidanren), honorary president of the International Association for Protection of Industrial Property (AIPPI) and chairman of BIAC Japan (a Japanese branch of the Business and Industry Advisory Committee of the Organization for Economic Cooperation and Development) as well as president of the Japan Association for the 1970 World Exposition. (He will resign the presidency of Keidanren late in May to become honorary president.)

Upon graduating from the Law Faculty of Tokyo University, Mr. Ishizaka joined the defunct Ministry of Communications. After five years with the ministry, he was invited to join the Dai-Ichi Mutual Life Insurance Co. and served as its president for eight years. During this period, he did a remarkable job of expanding the operations of the firm and raised it from the 13th to second rank among Japanese life insurance companies.

When the Tokyo Shibaura Electric Co. (Toshiba) was shaken by a serious labor dispute arising from mass dismissals after the end of World War II, Mr. Ishizaka assumed its presidency at the urging of business quarters concerned. He successfully resuscitated Toshiba, laying the foundation for the current prosperity of this giant electric machinery maker.

He thus emerged as a shining star in Japan's postwar business circles and became president of Keidanren in 1956. Since then, he has occupied the post for six consecutive two-year terms or a total of 12 years, creating the "Ishizaka Era" in the nation's economic world. Keidanren is an association of big enterprises and industrial organizations and its president is dubbed "Prime Minister of economic circles."

Standing 170 centimeters tall and weighing 85 kilograms, Mr. Ishizaka is of unusually sturdy build for a Japanese. It is partly for this reason that some people also refer to him as the "heavyweight champion of Japan's economic world."

He is a very studious man and, although Japanese generally are poor linguists, well versed in English, French and German. Since 1916, he has traveled abroad 32 times and has many friends in various nations. His such internationality led the American economic magazine Fortune to name him a "globalist" in 1967. "I seem to be more of a favorite abroad than in Japan," said Mr. Ishizaka jokingly. "I'm a man fit for export, don't you think?"

It was at the strong urging of the Government that Mr. Ishizaka agreed to assume the presidency of the Japan Association for the 1970 World Exposition, when other business leaders, apparently daunted by the enormous magnitude of the world fair, one after another declined the job. He said determinedly: "Now that Japan has decided to host Asia's first world exposition, we must make it far more splendid than the Tokyo Olympics." And to devote his whole energies to this formidable task, he has even made up his mind to resign as president of Keidanren in May.

EXPO '70 will be staged on a 3,300,000-square-meter site at the Senri Hills in Osaka Prefecture. With only a little less than two years to go before the start of the exposition, ground-leveling work is still under way at the fairgrounds. Some people in Japan have expressed apprehensions that the construction work might not be finished by the time the world fair opens. Yet Mr. Ishizaka confidently says: "Don't worry. We shall make it in



Government, because of its tight-money policy at the moment, is not setting aside enough money for preparations for EXPO '70. Dismissing such fear, however, Mr. Ishizaka declared: "Each time I see Prime Minister Eisaku Sato, I always tell him, 'If the world fair should turn out a poor affair, it would be you Prime Minister, and not me, who would be put to shame. And Mr. Sato never fails to reply, 'Don't worry.' So you don't have to be concerned about what is already evident."

Now that preparations for EXPO '70 are in the hands of Mr. Ishizaka, a typical embodiment of what the Japanese call "the spirit of the Meiji Era" (vigorous pioneer spirit), Asia's first world exposition is bound to be a signal success.

Left: As top business leader, Mr. Ishizaka is a busy man. For instance, he attends a conference in Tokyo in the morning, then goes to Osaka to take part in another conference in the afternoon, and leaves Japan to participate in an international parley several days later. Below: Mr. Ishizaka, a man of taste, enjoys pottery making at his kiln in Atami.

plenty of time."

Regarding the instability of world economy, as typified by the recent "gold rush," he commented: "To be sure, it looks like something of a panic. But America's economic power is far from weak. For instance, our budget for preparations for EXPO '70 amounts to approximately 52,000 million yen (excluding the construction costs of national pavilions of participating nations), but this sum is only three days' equivalent of America's military expenditure in Vietnam."

The year 1970 when the Japan World Exposition takes place is also the time when the Japan-United States Treaty of Mutual Cooperation and Security comes up for review. Already, ultra-leftist "Zengakuren" (National Federation of Student Self-Government Associations) has launched a violent campaign against the renewal of the pact. This has given rise to anxiety in some quarters that EXPO '70 might be adversely affected by the leftist forces' drive against the treaty in 1970. But displaying a firm resolve to make a success of EXPO '70, Mr. Ishizaka said: "I don't say I am not concerned at all. But EXPO '70, you know, is an event to show off the grand achievements of man's culture and industry. So how about subduing Zengakuren with this magnificent show?"

There is a criticism, meanwhile, that the



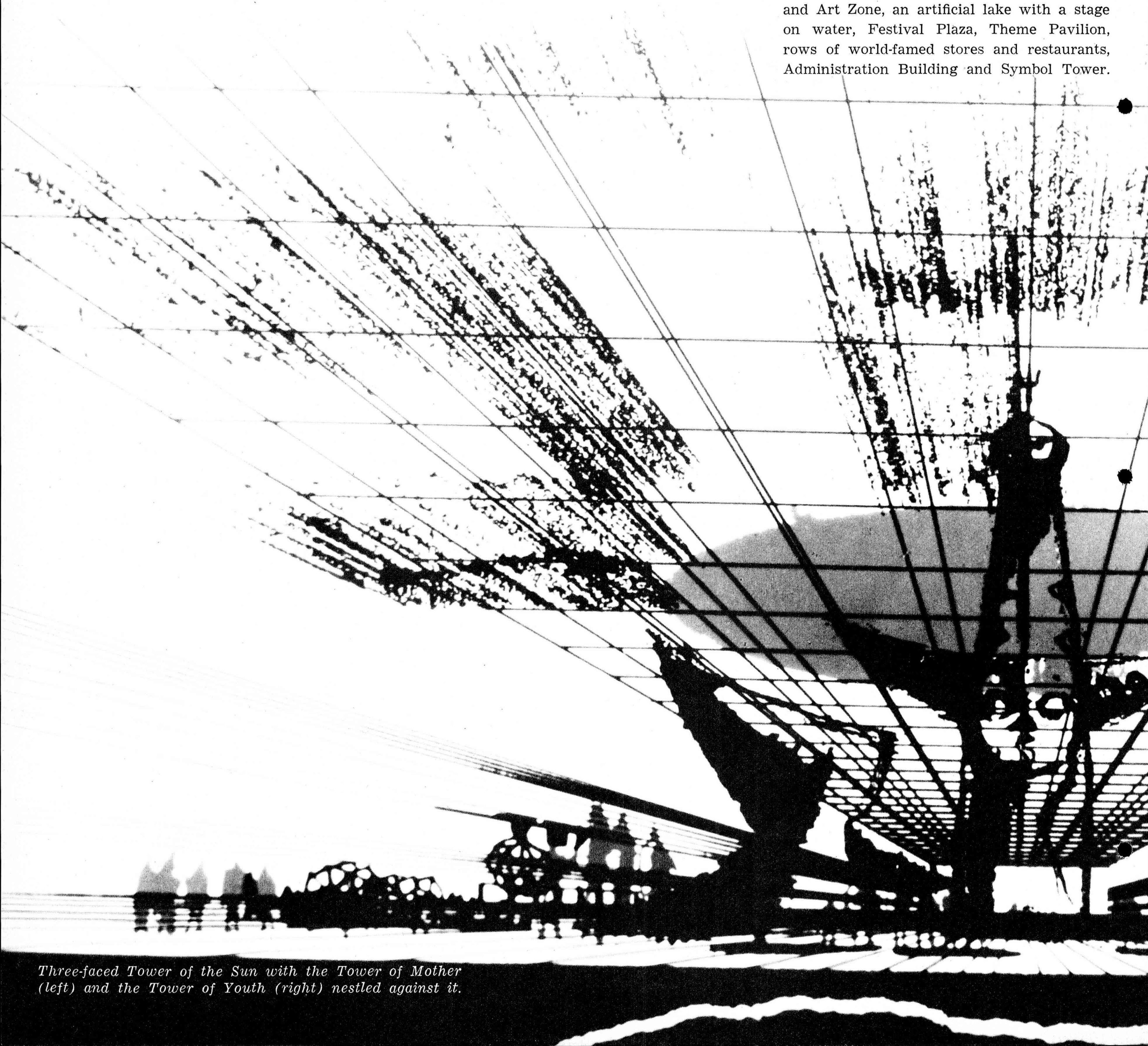
what will EXPO '70 be like?

In a vast 3,300,000-square-meter expanse of red earth carved out of an undulating verdant area in the suburbs of Osaka, sites for the Symbol Zone, artificial lake and pavilions of participating nations and enterprises for the Japan World Exposition, Osaka, 1970 (EXPO '70) have now taken clear-cut shapes, bringing the broad outline of the "festival of man" into bold relief with less than two years to go before its opening. EXPO '67 in "Montreal of Water" closed on October 29, leaving a great many topics and new records in the history of world fairs. And on March 15, 1970, EXPO '70 in "Osaka of Verdure" will open as the first full-scale world fair in Asia.

Representatives of participating nations have already visited the fairgrounds to work out plans for their exhibitions, while as much as 80 per cent of the site earmarked for Japanese private enterprises were booked on the first day of offering on April 1 last year, and their exhibition plans have since been made public one after another. Concrete forms have already been given to the concepts of the Recreation Zone, providing a delightful, beautiful world of dreams and the Symbol Zone forming the heart of EXPO '70. The fairgrounds will be dotted with ponds, plazas, gardens and towers. Here is a glimpse of EXPO '70, a "City of the Future" emerging two years hence at the Senri Hils in Osaka Prefecture.

On the whole, the undulating fairgrounds are 25 to 70 meters above sea level to form a basin with hills rising gradually from the center. Four "moving roads" starting at as many gates—east, west, north and south—will converge upon the lowest central area, which will form the Symbol Zone.

This zone, extending from north to south, will be 900 meters long and 150 meters wide. It will consist of, from north to south, Culture and Art Zone, an artificial lake with a stage on water, Festival Plaza, Theme Pavilion, rows of world-famed stores and restaurants, Administration Building and Symbol Tower.



Three-faced Tower of the Sun with the Tower of Mother (left) and the Tower of Youth (right) nestled against it.

It will take one full day to see all of these facilities. Festival Plaza will form the core of the Symbol Zone. Here, opening and closing ceremonies will take place and visitors from various countries will enjoy friendly interchanges. The plaza will feature a giant, transparent roof 30 meters high, 100 meters wide and 300 meters long. Made of reinforced glass or plastic, it can be freely opened and shut to adjust inside temperature.

Throughout the 183-day fair, upward of 3,000 shows and other forms of entertainment will take place mainly in the plaza with as many as 950,000 performers participating. Visitors will thus be treated to colorful shows every day—elephant hunting of Thailand, Bolshoi Circus, Carnival of Rio de Janeiro, 1,000-member chorus, 2,000-member drum and fife band and 3,000-piece brass band. Water will play an important part in enhancing the splendor of Festival Plaza. The artificial lake spreading to the north of the plaza will shoot up a 50-meter-high, 200-meter-wide screen of water. The western roof will be marked by a water curtain interrupting the setting sun. With nightfall, iridescent illuminations will light up the roofs, stairs and walls.

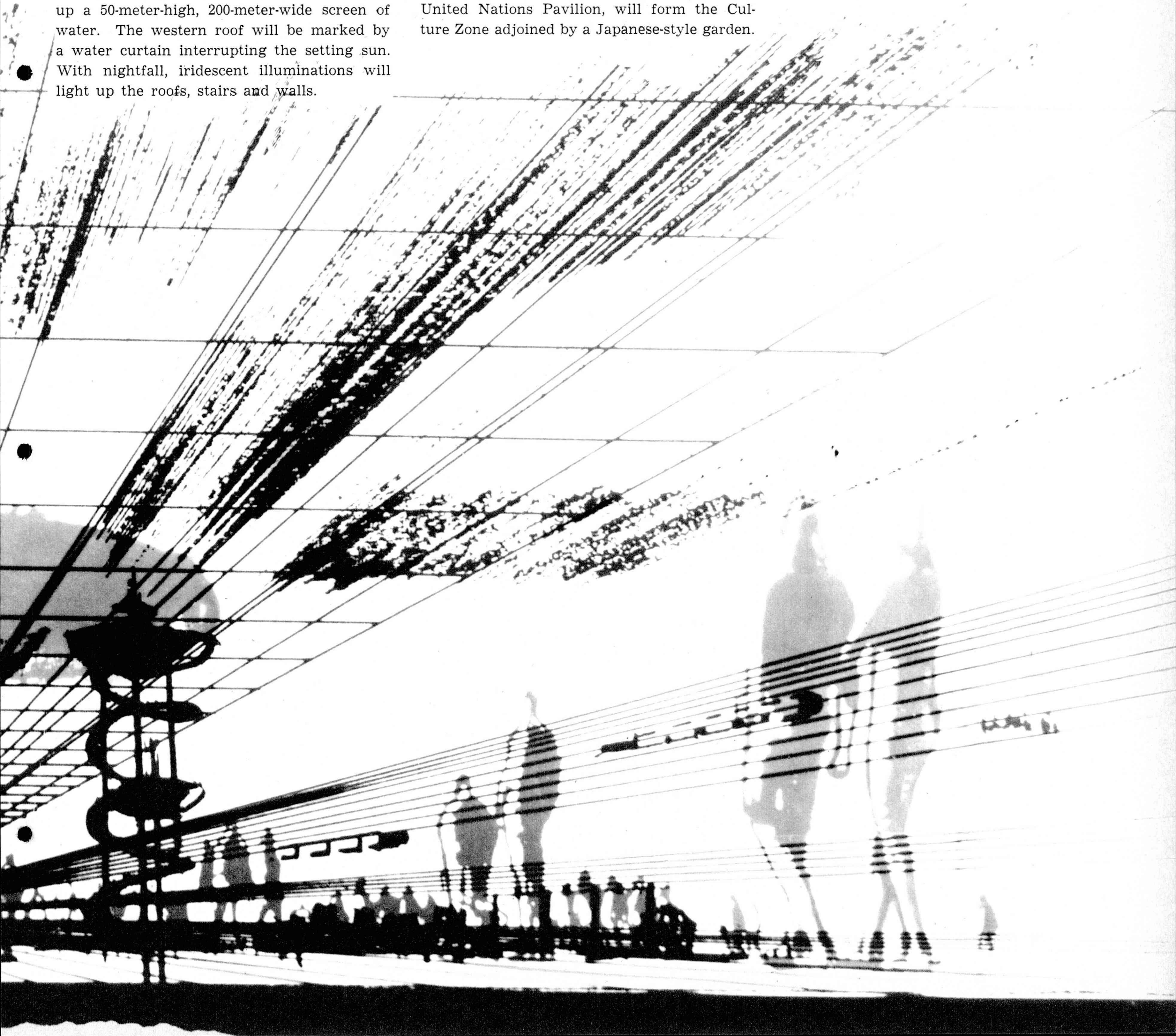
On the south of Festival Plaza, the "Tower of the Sun" of the Theme Pavilion will stand 60 meters high, piercing the roof. The mammoth sculpture will have three "faces"—at the top, and on the southern and northern sides in the middle. Two giant horns will protrude from both sides of the two middle "faces." The "Golden Face" at the top will virtually be the guardian deity for EXPO '70. It will show expressions of pleasure and grief, depending on the light and the viewer's angle. Nestling against the giant tower will be the "Tower of Mother" and the "Tower of Youth." With these towers as main stages, the Theme Pavilion will portray the past, present and future.

Rising high at the southern end of Symbol Zone is a 150-meter-high observation tower with its three pillars combined with a frame marked by geometrical figures. In the northern section, a cluster of structures, including an art museum, a multi-purpose hall and the United Nations Pavilion, will form the Culture Zone adjoined by a Japanese-style garden.

The Expo '70 authorities are hopeful that this Symbol Zone will not be a mere symbol, but serve as an embodiment of the very purpose of the exposition, making every visitor really feel, "It was indeed a good thing to come and see Expo '70." The buildings in the Symbol Zone are to be preserved even after the closure of the world fair.

Let us now enter the exhibition zones in the eastern and western sections by "moving roads" with a speed of 40 meters per minute.

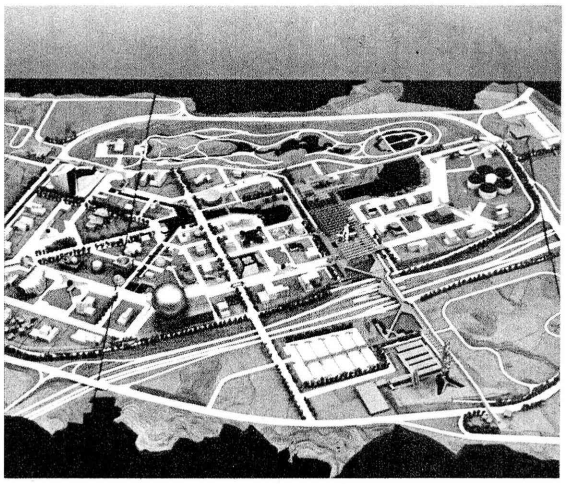
An 80-meter tower with Japan's Rising Sun flag fluttering at the top rises in the middle of five cylindrical buildings arranged in the shape of cherry blossom petals . . . . this is the Japanese Government's pavilion featuring the theme of "Japan and the Japanese." One of the salient characteristics of this pavilion is that the whole of the structure "floats" 10 meters above the ground. When seen from above, it forms the cherry blossom emblem



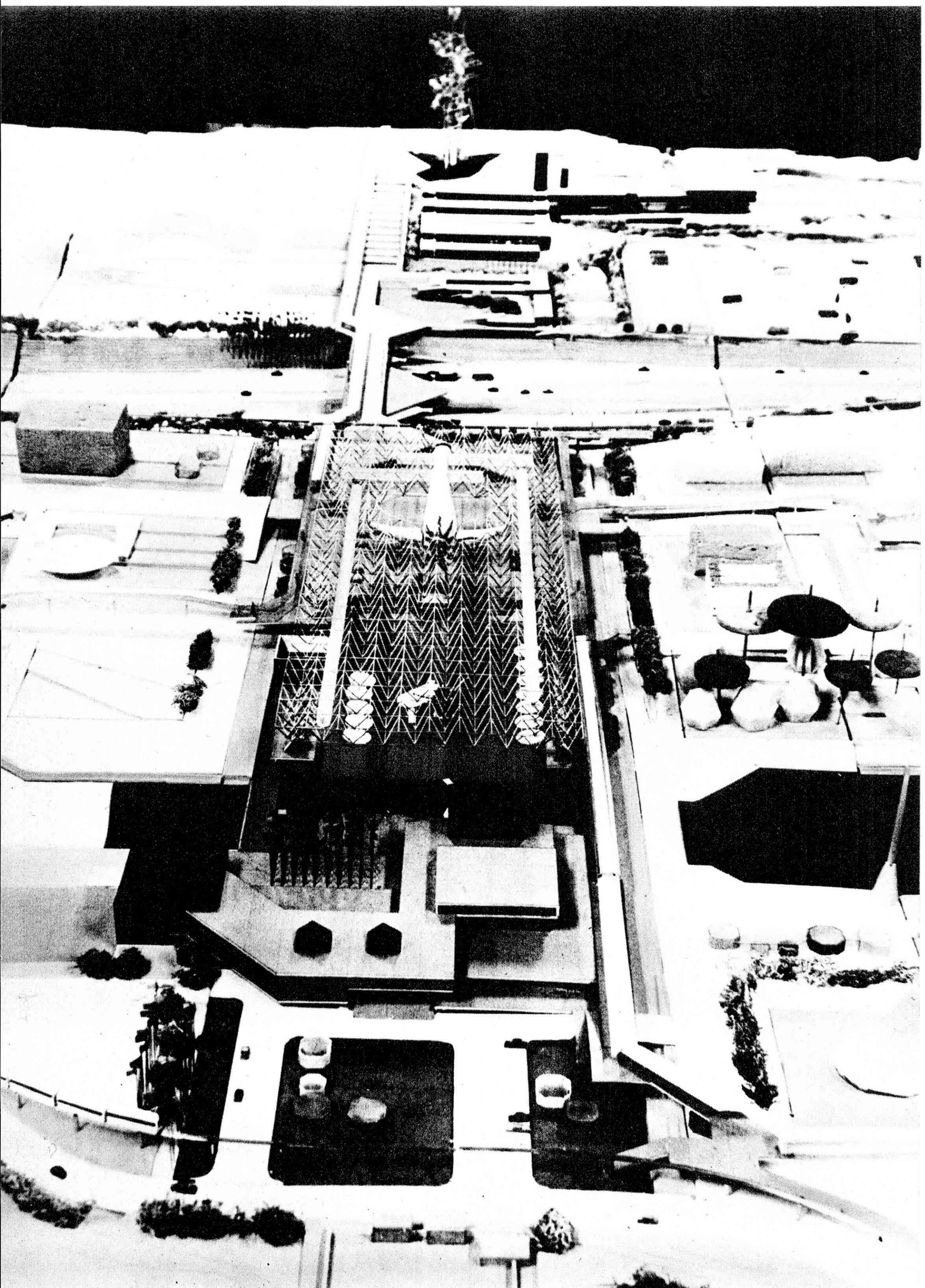
of EXPO '70. There is not a single pillar inside the buildings, which introduce Japan's industry and culture of the past, present and future. Worthy of special note are the products of "science of tomorrow," such as an automatic robot interpreter, automatic orchestra, and three-dimensional pictures.

Canada, the first nation outside Japan to express a formal intention to participate, will build the "Palace of Mirrors" based on the theme of "discovery" on a site immediately west of the main gate. The United States will construct a spherical pavilion similar to those it built at the Brussels and Montreal expositions, while the Soviet Union is expected to build a triangular pavilion. France has not yet bared its plan, saying it will spring a big surprise at the opening of the fair. Private Japanese enterprises and industrial groups are racking their brains to present unique themes, ideas and designs, and already starting energetic publicity campaigns to attract as many visitors as possible to their pavilions. Their intriguing plans include the "Song of Iron" pavilion, the "Hall of Fibers," and a "castle" of items for personal beautification. Paint makers will set up a "scribbling corner," while camera makers will provide a special service for locating lost children.

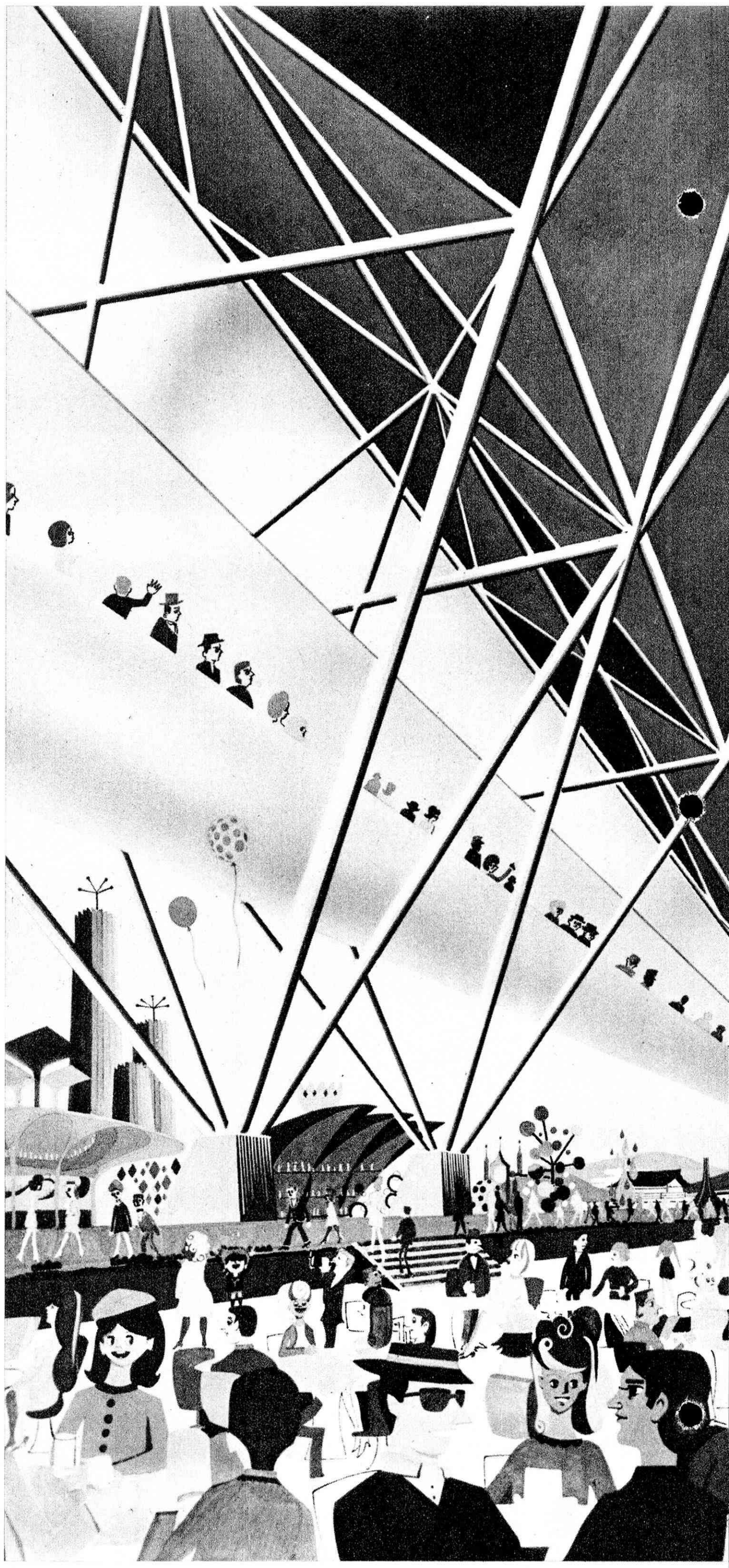
Recreation Zone in the 180,000-square-meter southeastern section of the fairgrounds will be a veritable paradise for children. A colorful variety of facilities, such as "Daidarasaurus" (Dinosaur Jet Coaster), "Hide-and-



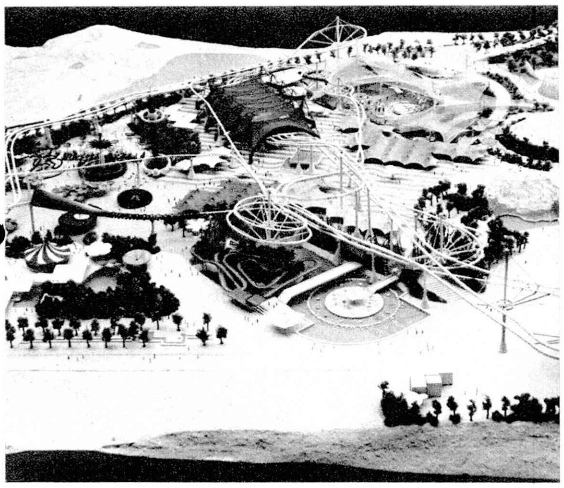
A model of Osaka Exposition site, completed by the basic facilities designing group.



Symbol Zone. (From the foreground) Multipurpose Hall, Stage on Water and Festival Plaza. Symbol Tower rises, piercing through transparent roofs. Landmark is seen in the background.



Festival Plaza is the heart of the fair site and where people can get together, transcending differences in nationality, race, and language.

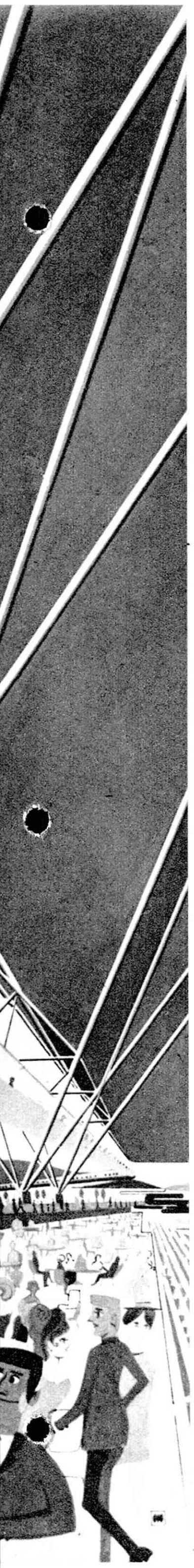


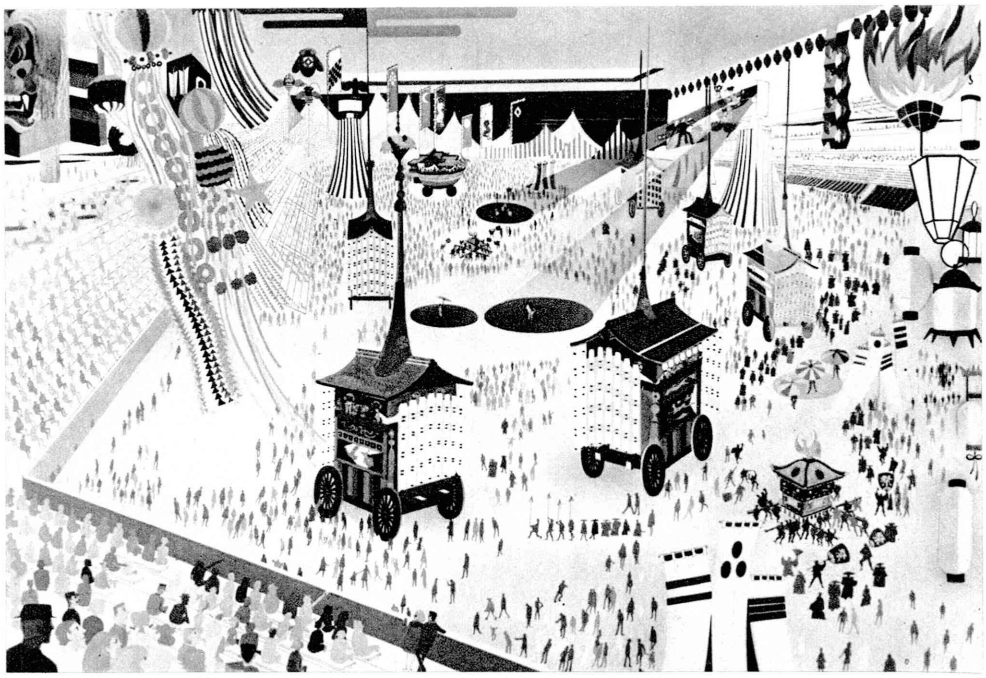
The Recreation Zone. White lines running through the zone are 'Daidarasaurus' rails.

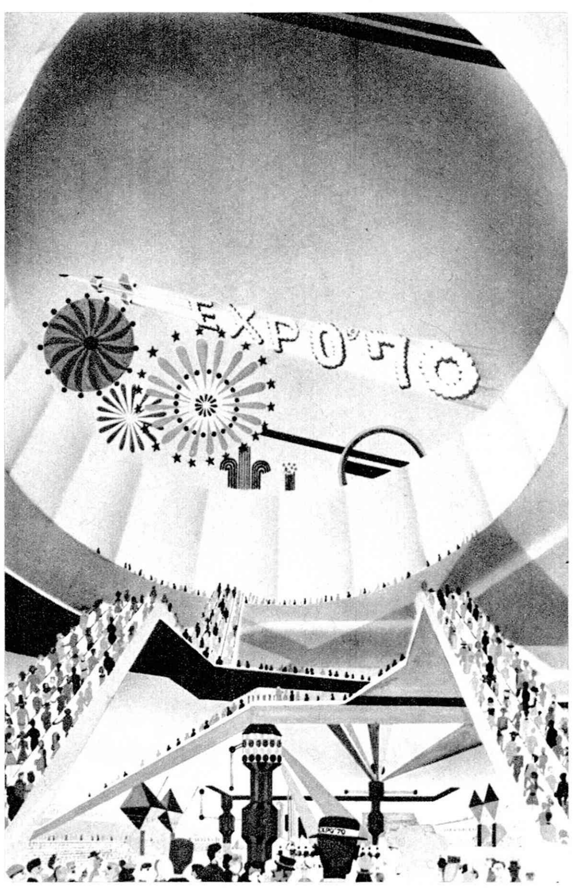
Seek Garden," "Castle of Glass," "Land of Labyrinth," and "Forest of Remembrance," will fascinate children so much that parents will find it very hard to move them away to other sites.

The people of Osaka have been particular about food from olden times. So every form of service will be furnished to satisfy both the appetite and palate of numerous visitors, expected to number about 400,000 a day.

Now let us take rest at a coffee room capable of accommodating 500 visitors atop the observation tower rising 140 meters high at the southern end of Symbol Zone. Here we command a panoramic view of a "city of the future" with "moving roads," monorails and electric minicars threading their way through

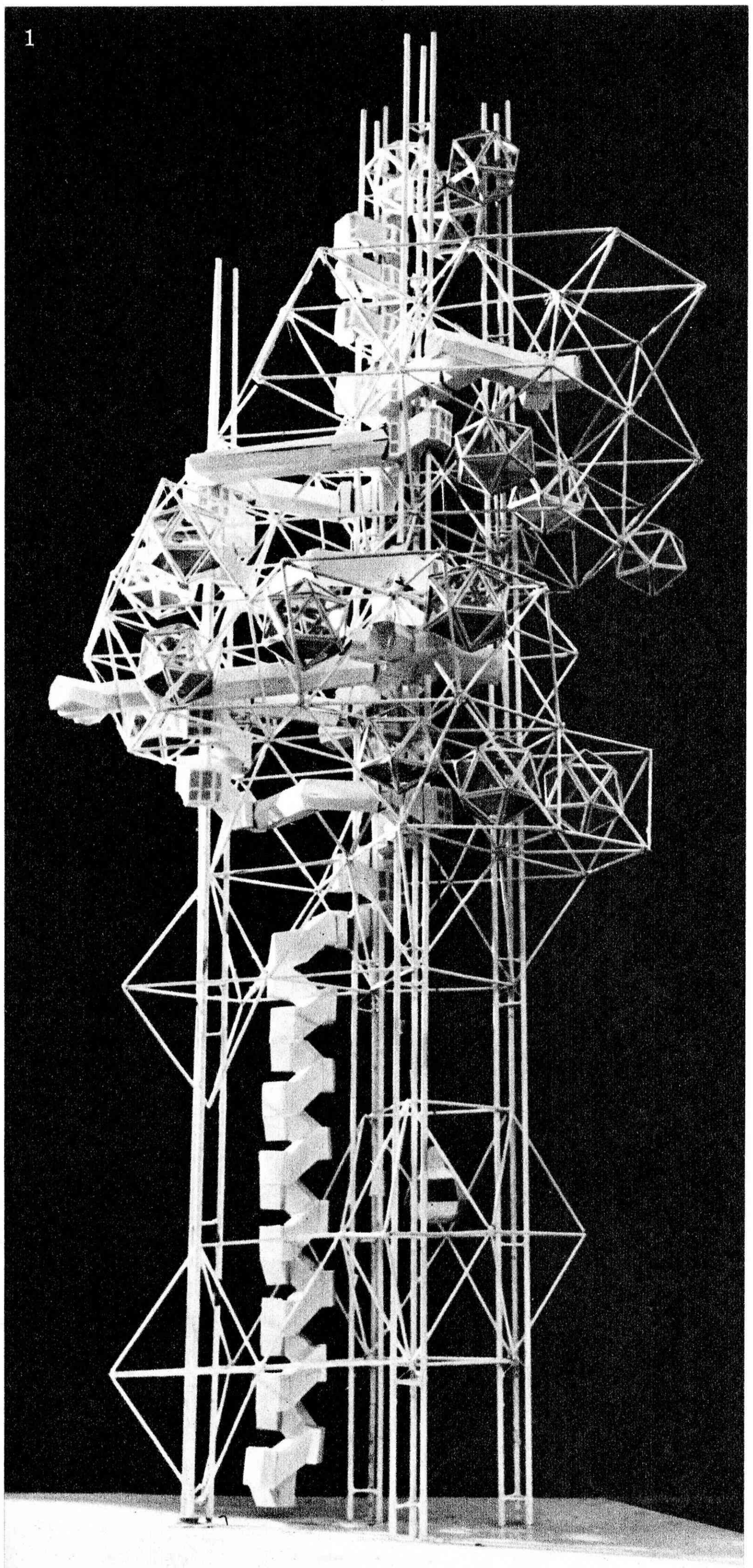


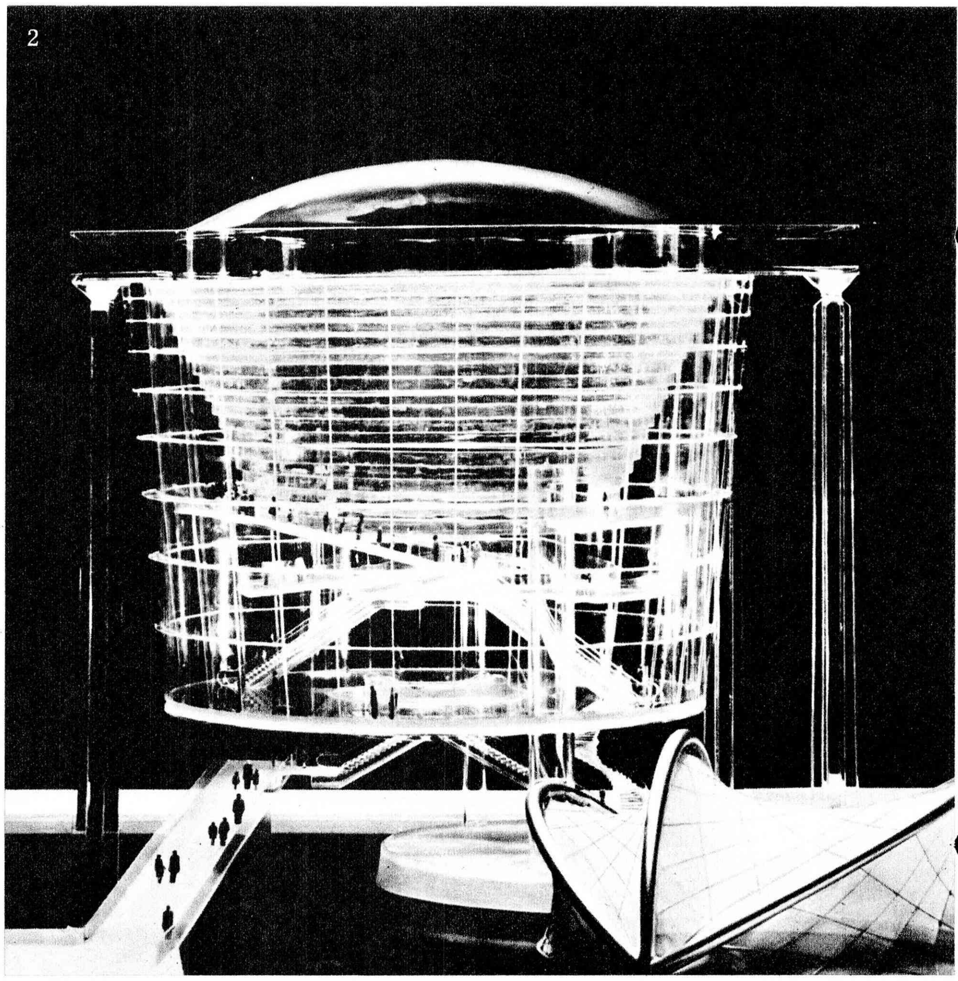


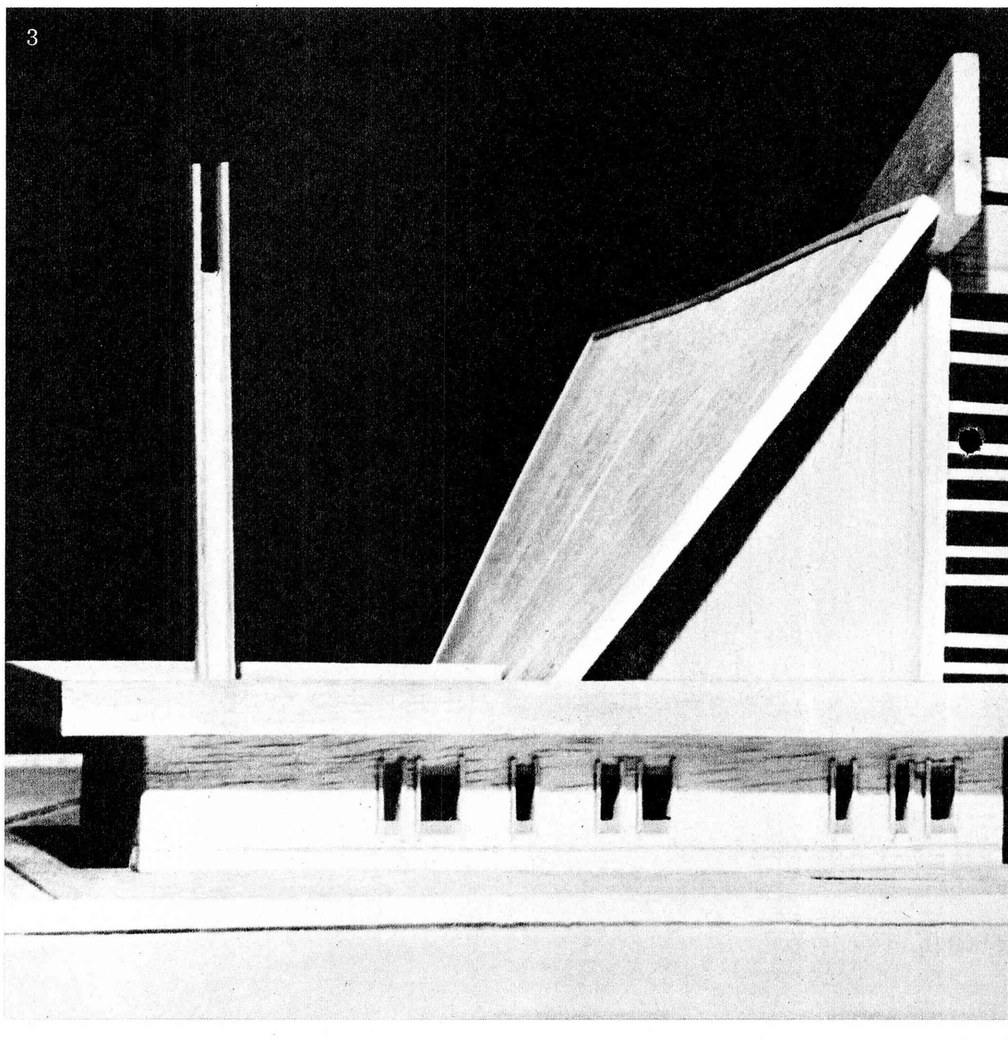


Above: In the Festival Plaza, both performers and spectators stand on the same floor. It is capable of accommodating 50,000 people. Left: Escalator, set up in the Tower of the Sun, leads visitors to the "Future" section of the Theme Pavilion. Illustrations by Hiroshi Manabe.

varied structures of new designs and materials. In Festival Plaza and the sub-plazas surrounding it, we see wedding ceremonies under way and many people chatting and laughing happily. Now heart-to-heart contacts among the peoples of the world, transcending differences in thought and religion, are blossoming into reality at the vast Senri Hills, while they peacefully compete in showing off the cream of their science and technology. Lit up by the setting sun, the face of EXPO '70's guardian deity atop the "Tower of the Sun" now shines with infinite bliss at the sight of the real harmony of mankind.

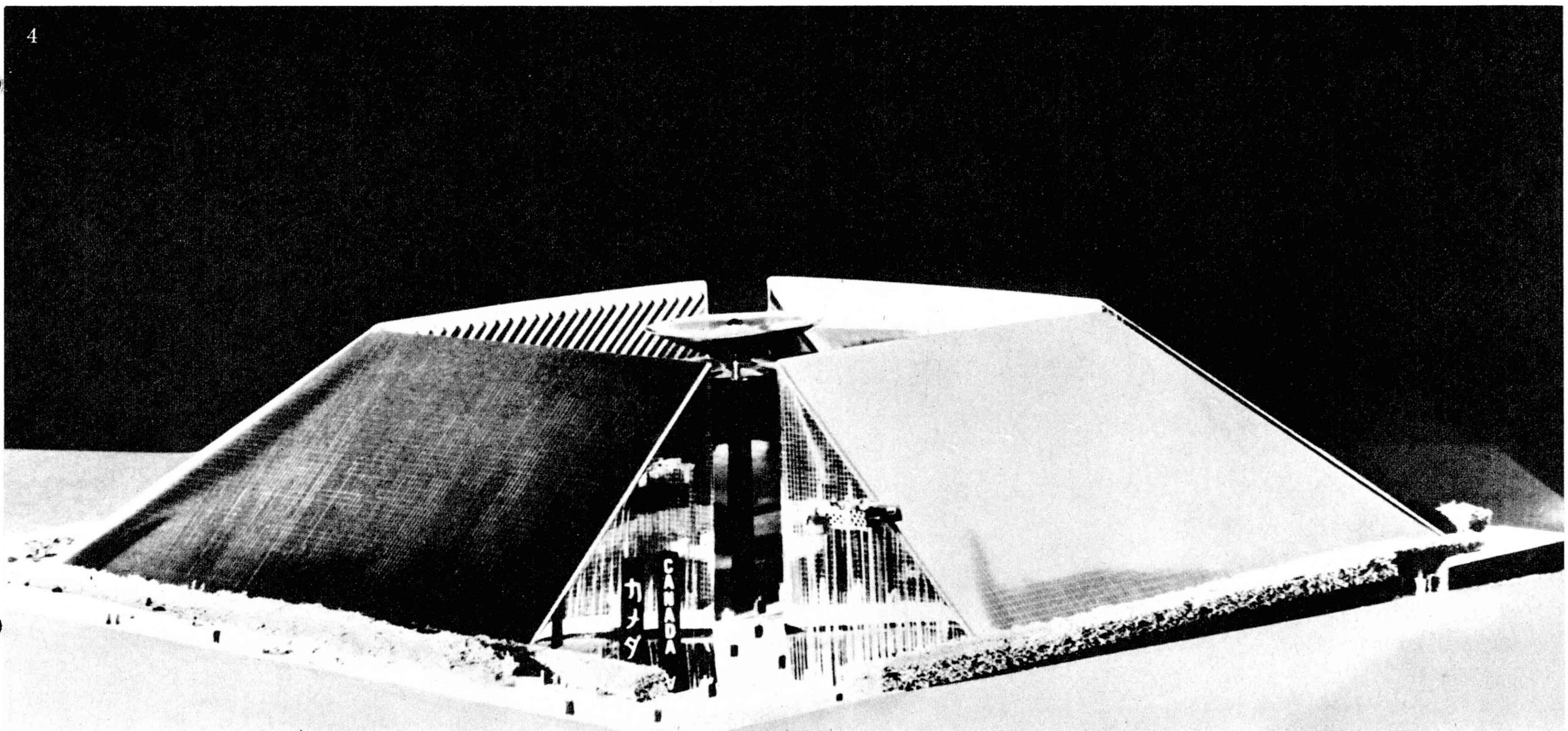






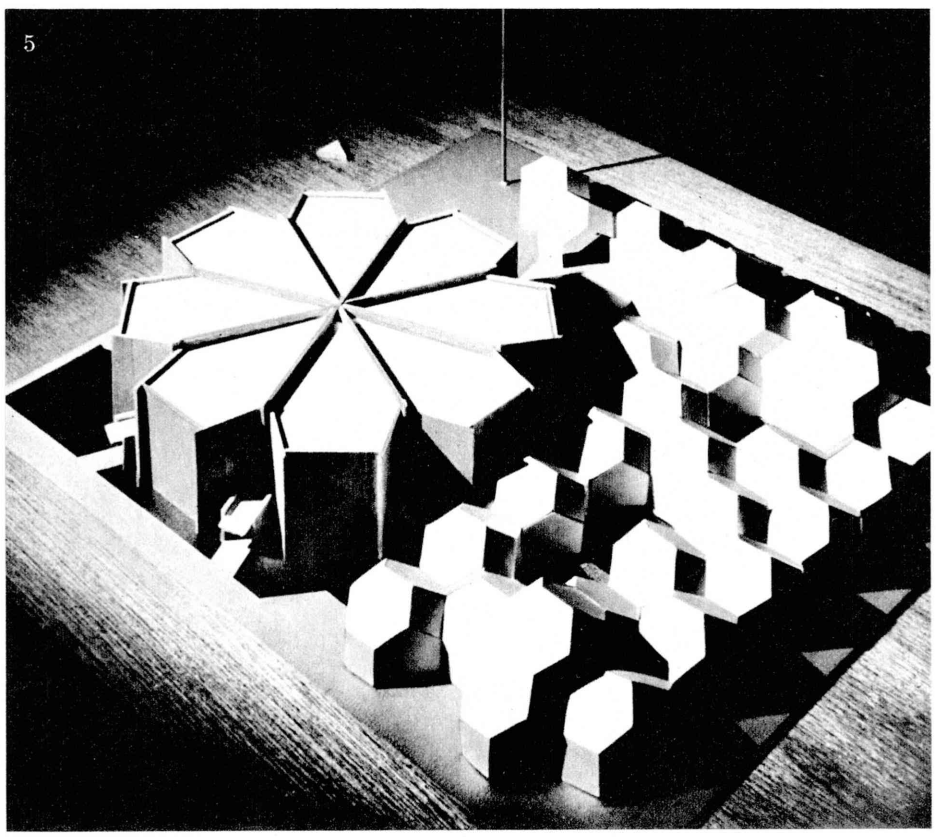
(1) Landmark 150 meters in height. It will contain observation, tea and watch rooms. At night, the landmark will stand out in relief amid a flood of iridescent illumination. (2) Electric Power Hall to be built jointly by Japan's nine electric power companies. The role of electricity in modern civilization will be featured under the theme of "Mankind and Energy." (3) Japanese Folk Art Hall. Japan's

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traditional folk art items will be exhibited by department stores and textile makers. (4) Canadian pavilion with exterior walls panelled all over with mirrors. The water of ponds located on both sides of the entrance is reflected brilliantly by the mirror walls. (5) Life and Industry Hall. Smaller firms, which boast excellent business records, will display their characteristic exhibits in the joint pavilion.

THE JAPANESE SWORD: SECRETS OF ITS CHARM

Text by TADAO TSUJIMOTO
Cultural Property Protection Commission

THE Japanese sword, a weapon to slash or pierce the enemy, was made of cast bronze in olden times, but the unique method of hammering red-hot iron into shape was developed toward the 5th century. Usually, the Japanese sword as we know it today means one made by the latter method.

The first requirement of the Japanese sword is to cut well. The second important factor is that neither the blade nor the edge must break. To cut well, metal material must be hard, and the edge sharp. But to prevent the blade and the edge from breaking, the metal must be elastic. Japanese swordsmiths made painstaking efforts to meet and harmonize these two conflicting requirements.

First, iron for the Japanese sword is made from iron sand. High-grade iron is obtained through low-temperature treatment, which precludes impurities, such as phosphorus and sulphur.

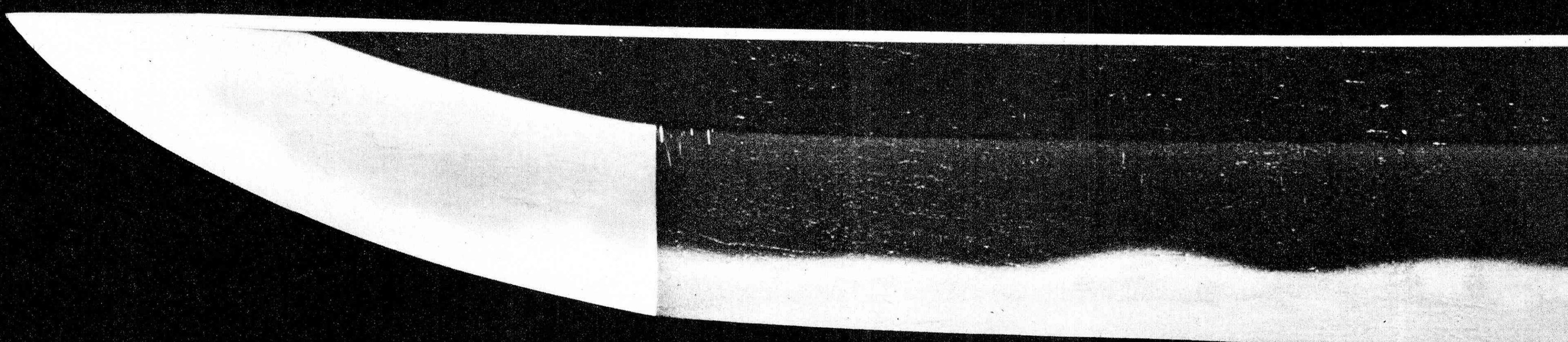
Secondly, two or three kinds of steel differing in hardness are made by either adding carbon from outside or removing carbon from inside. That is, the higher the carbon content, the greater the hardness of steel. On the contrary, hardness can be reduced by decreasing the carbon content and increasing the percentage of iron. To make steel material, a lump of iron is beaten with a hammer into a long, rather thin sheet. After that, many a cut is made on the sheet, which is then folded again at each cut into a sort of lump. It is then heated in charcoal fire, beaten into a long sheet and folded again. This process is repeated seven to 13 times. Assuming the folding is done 10 times, the final steel sheet consists of more than 1,000 very thin layers. As a bundle of many thin wires is more elastic and stronger than an iron bar with the same volume, so is a multi-layered iron sheet tougher than a single sheet. Moreover, the joints of layers present a peculiar pattern like the grain of wood.

Thirdly, these long, thin sheets are combined to make a sword. Placed in the middle is a sheet, which is rather low in hardness but high in elasticity. On both sides of the sheet and along the part that forms the edge, very hard steel sheets are attached with binding agent. This combination of steel sheets is then heated in a charcoal fire and then beaten into the shape of a sword by hammering both sides evenly. The sword thus made has a core of elastic iron surrounded by hard steel. This structure satisfies the two conflicting requirements—namely, that the sword must be hard and must not break.

Fourthly, a tempered edge is put on the blade. That is, mud is spread along the blade in the desired pattern of edge. It is then heated in the fire and suddenly cooled in cold water to make the tempered edge. This is that part of the Japanese sword which looks white through its entire length. The thin, sharp edge is made still harder by this tempering process, which fulfills the condition that the sword must cut well.

Fifthly, there is the problem of appearance and shape. In olden times, the sword was straight like a pole. This was fit for piercing. But slashing with such a sword was rather difficult because of too much resistance. Experiences in actual fights finally led swordsmiths to realize that it was better to have the blade slightly curved. As a result, all swords started to be given a curve toward the 11th century. Namely, the blade is arched in such a way as to make about the middle portion stronger than other parts. The blade is wide and thick near the base, but gradually becomes narrower and thinner towards the edged point. The tang (the part which enters the hilt) also gets narrower near the point. Therefore, when seen from the side, the blade as a whole presents a smart figure like a long streamlined ship.

The Japanese sword thus made by the swordsmith is then whetted by the *togishi* (master sharpener). He whets and polishes the surface of the blade like a mirror with many whetstones, proceeding from rough to finer ones. At the same time, he is charged with the task of adjusting the whole appearance of the blade. If the swordsmith is likened to the father of the Japanese sword, the sharpener is the mother, and their cooperation gives birth to the exquisite sword peculiar to Japan. The "straight and cross grains" of steel texture, *suguha* (straight edge pattern) and *midareba* (wavy edge pattern) vividly emerge on the surface as a result of the whetting and polishing.



WHEN you appreciate the beauty of the Japanese sword, you should first pay attention to the appearance and shape, then the texture of steel (the degree of forging and tempering, and *jimon* or patterns on the ground), and finally, tempered edge (the density of molecules forming the edge and *hamon* or pattern of edge).

Japanese swords have been made from ancient times. And in all eras, swordsmiths made it a habit to form groups in various parts of the country, and each group had characteristics of its own. Among major groups of swordsmiths were Yamashiro (Kyoto Prefecture), Yamato (Nara Prefecture), Bizen and Bichu (Okayama Prefecture), Mino (Gifu Prefecture) and Sagami (Kanagawa Prefecture). Moreover, each major group was further divided into medium or smaller groups.

From the 17th century, swordsmiths converged upon the sites of feudal lords' castles and major towns—for instance, Edo (Tokyo), Kyoto, Osaka, Sendai, Nagoya, Kanazawa, Hiroshima, Fukuoka, Saga and Kagoshima. Present-day swordsmiths are turning out Japanese swords merely to retain the traditional techniques handed down from generation to generation. There are now about 200 of them in various parts of the country, and of course, no revival of the past prosperity of Japanese swordsmiths could be expected in this modern world.

The manufacture of Japanese swords starting toward the 7th and 8th centuries has a history of about 1,200 to 1,300 years. But the most prosperous period (that is, the period which left many fine swords to the present time) was about 800 years from the 11th to the first half of the 19th century. During this period, the style of Japanese swords underwent one major change after another. From this point of view, it may be divided into five periods, i.e. the Heian Period (11th and 12th centuries), Kamakura Period (13th century and first half of 14th century), Nanbokucho Period (latter half of 14th century), Muromachi Period (15th and 16th centuries) and Momoyama-Edo Period (17th century to first half of 19th century). And this broadly corresponds to the political classification of the 800-year period.

If one wants to appreciate Japanese swords at length, one must first have a general idea of the characteristics of both these periods and major groups of swordsmiths. A great many swordsmiths produced large numbers of swords. Yet if only one grasps the characteristics of representative swordsmiths and their products, it is not very difficult to appreciate other swords by analogy on the basis of this knowledge. Therefore, typical swords of Japan are outlined below from the angles of both period and the swordsmiths' group to give the readers such basic knowledge:

HEISHI SHORIN-KEN: Made in the 7th or 8th century, this is a straight sword without a curve. Its edge has a straight pattern. Letters are inscribed on the blade. This is a Japanese sword of the earliest period, but its maker is not known.

BIZENKUNI TOMONARI: This slightly curved *tachi* (long, slender sword) was made in the 12th century by Tomonari of Bizen. The edge pattern is *komidareba* (relatively wavy pattern), and the texture shows "straight grains." A small sword is carved near *nakago* (tang), which bears an inscription of the maker's signature. From this period on, swordsmiths formed the habit of inscribing their signatures on their works.

RAI KUNIYUKI: This sword was made by Kuniyuki of Yamashiro in the latter half of the 13th century. The edge pattern is marked by large showy waves. This period was characterized by both large blades and large edge patterns.

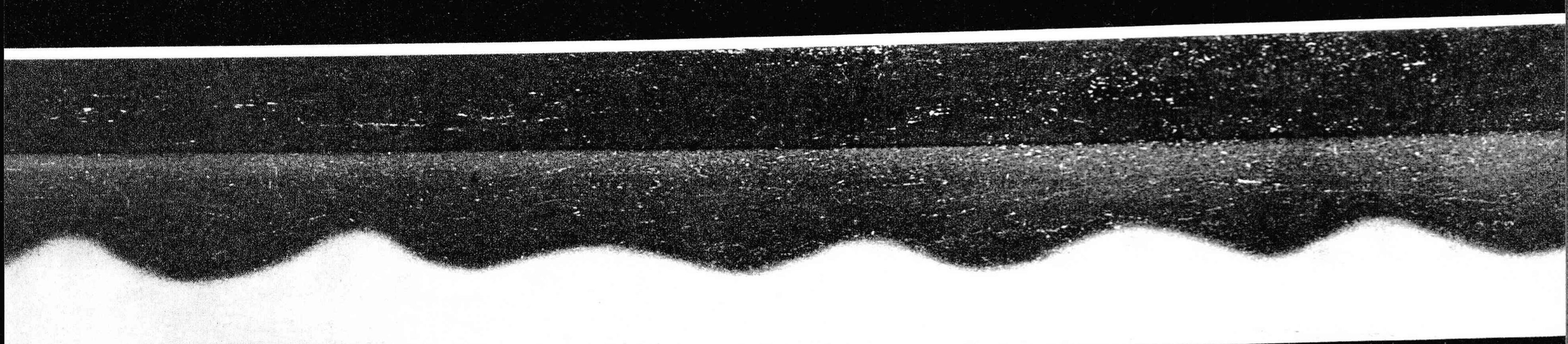
MASAMUNE: This is a dagger made by Masamune, who lived in Kamakura, Sagami, in the first half of the 14th century. The edge pattern has a rich variety of waves. The dagger bears a carving of Fudo Myo-o (God of Fire).

KANEMOTO: Made late in the 15th century, this is a *katana* (shorter sword). About the middle of that century, there was a shift from *tachi* to *katana*, since swords started to be inserted under the sash instead of being hung from the waist as in the past. As a result, the sword was shortened somewhat, while the swordsmith's signature began to be inscribed on the opposite side. Kanemoto was a swordsmith of Mino. The swords of this region were generally marked by a jagged edge pattern like the teeth of a saw.

KUNIHIRO: Made in the first half of the 17th century by Kunihiro of Kyoto, this sword has a wide blade and a big point.

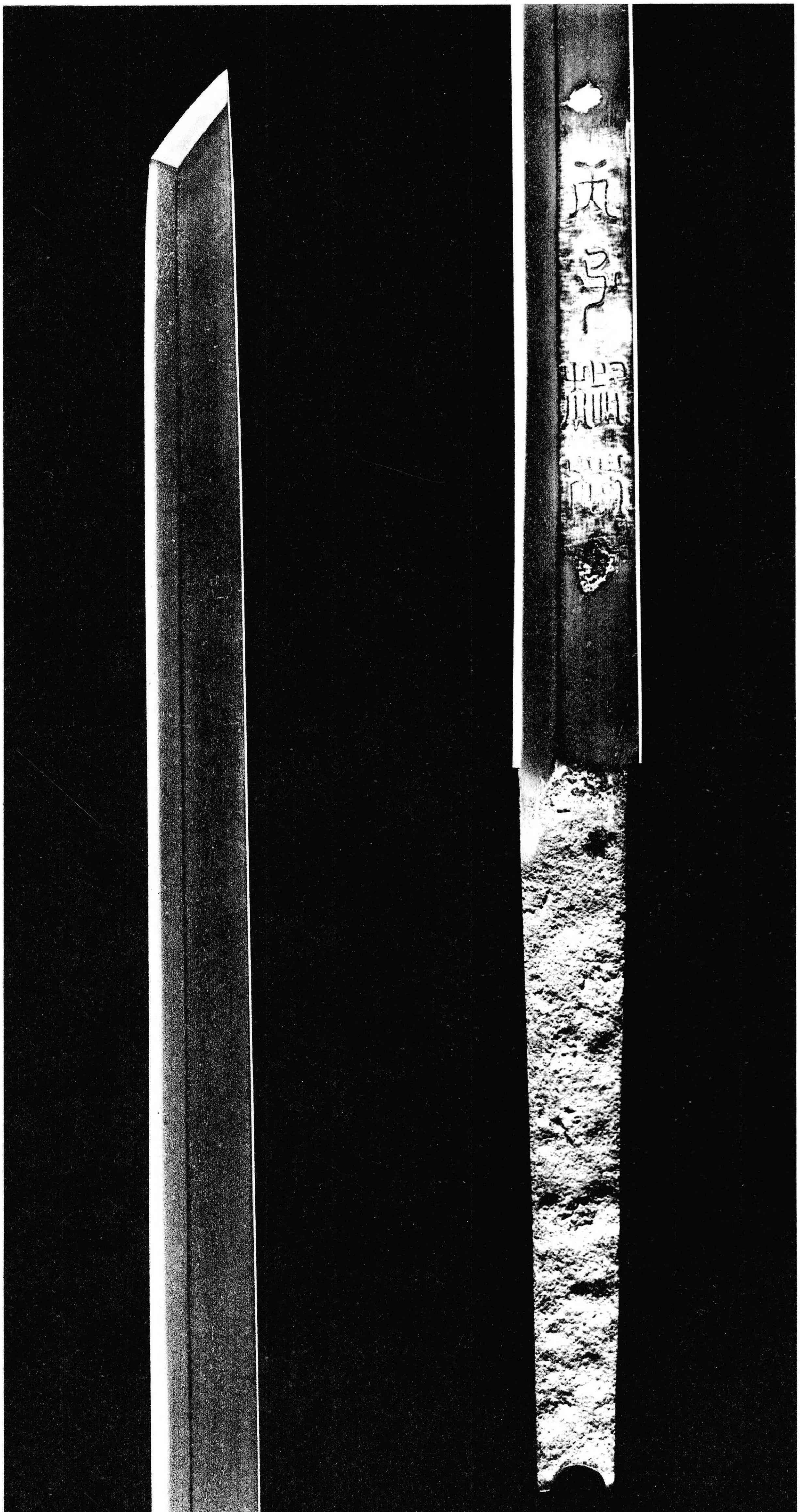
KOTETSU: This sword was made by Kotetsu of Edo in the latter half of the 17th century. It is *wakizashi*. In the Edo Period, *samurai* (warriors) made it a habit to wear a *katana* and a short one of the same shape (called *wakizashi*) together. *Wakizashi* is about 15 to 18 centimeters shorter. Its edge pattern consists of a regular row of round-headed waves.

The Japanese sword has long since ended its mission as sharp weapon and now exists as an exquisite product of Japan's time-honored craftsmanship. The beauty of the Japanese sword originated in the necessity of meeting the actual requirements of *samurai*, who used the weapon in actual fighting. Yet the simple, clear-cut appearance of the Japanese sword, its serene, lucid texture and the clearness of edge pattern cannot but capture the heart of those who appreciate it. I wonder if there is any other weapon in the world, which has such pure beauty as the Japanese sword?

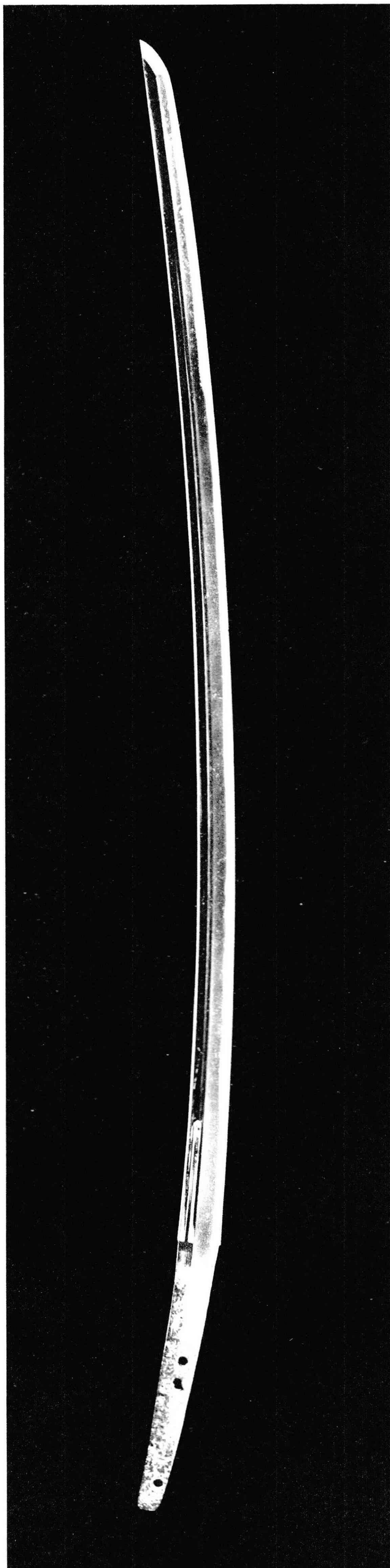


Kanemoto: 15th century. This photo is twice as large as actual size.

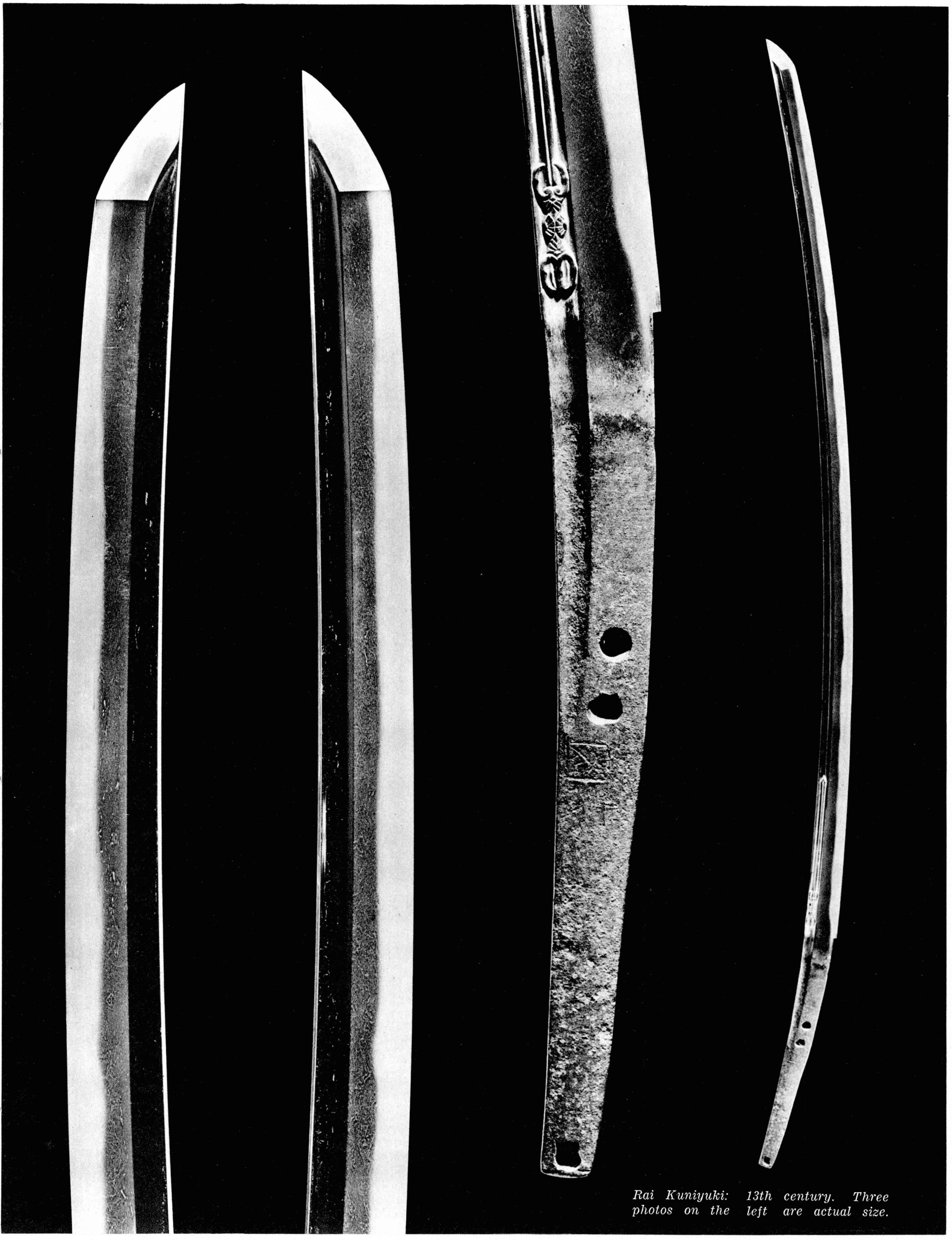
Photos by courtesy of Otsuka Kogeisha Co.



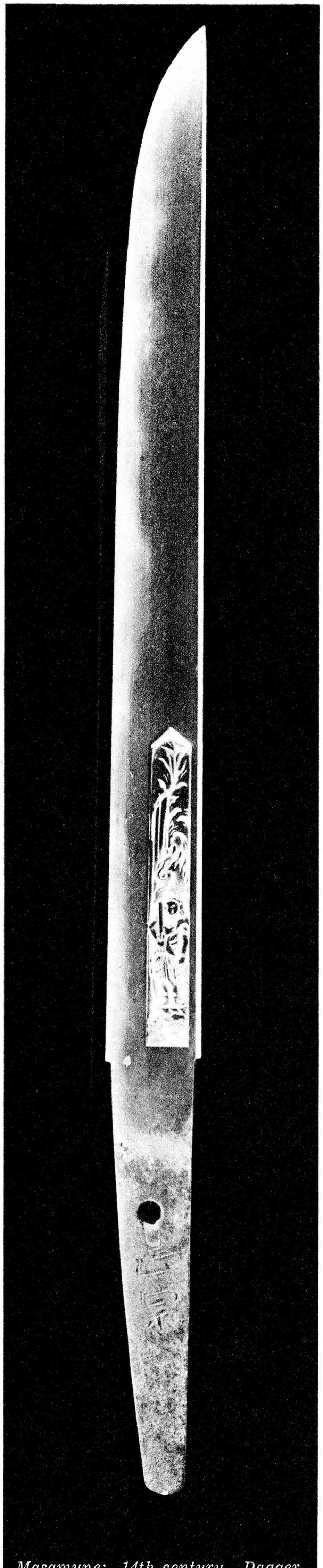
Heishi Shorinken: 7th or 8th century. Actual size.



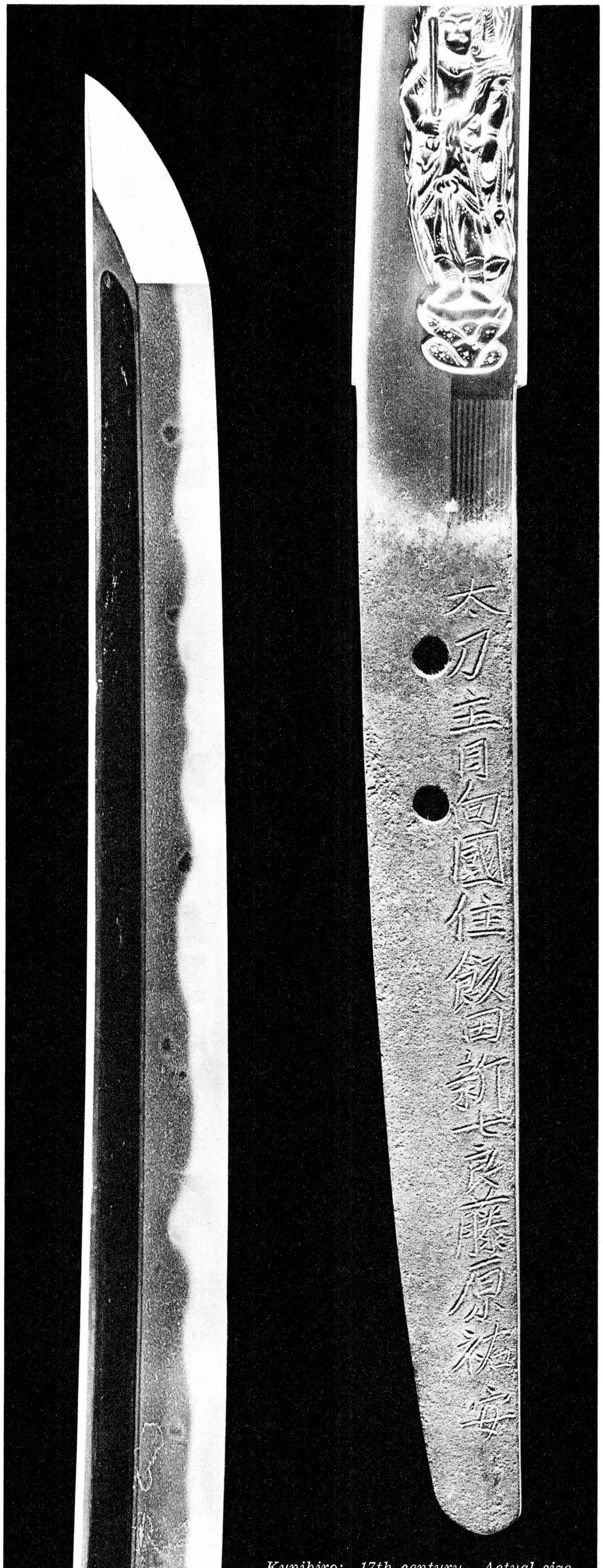
Bizenkuni Tomonari: 12th century.



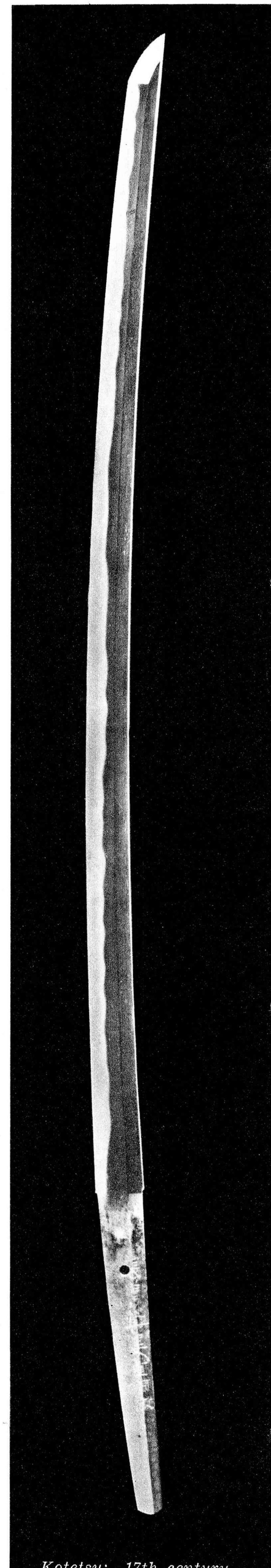
Rai Kuniyuki: 13th century. Three photos on the left are actual size.



Masamune: 14th century. Dagger.



Kunihiro: 17th century. Actual size.



Kotetsu: 17th century.

LIVING NATIONAL TREASURE

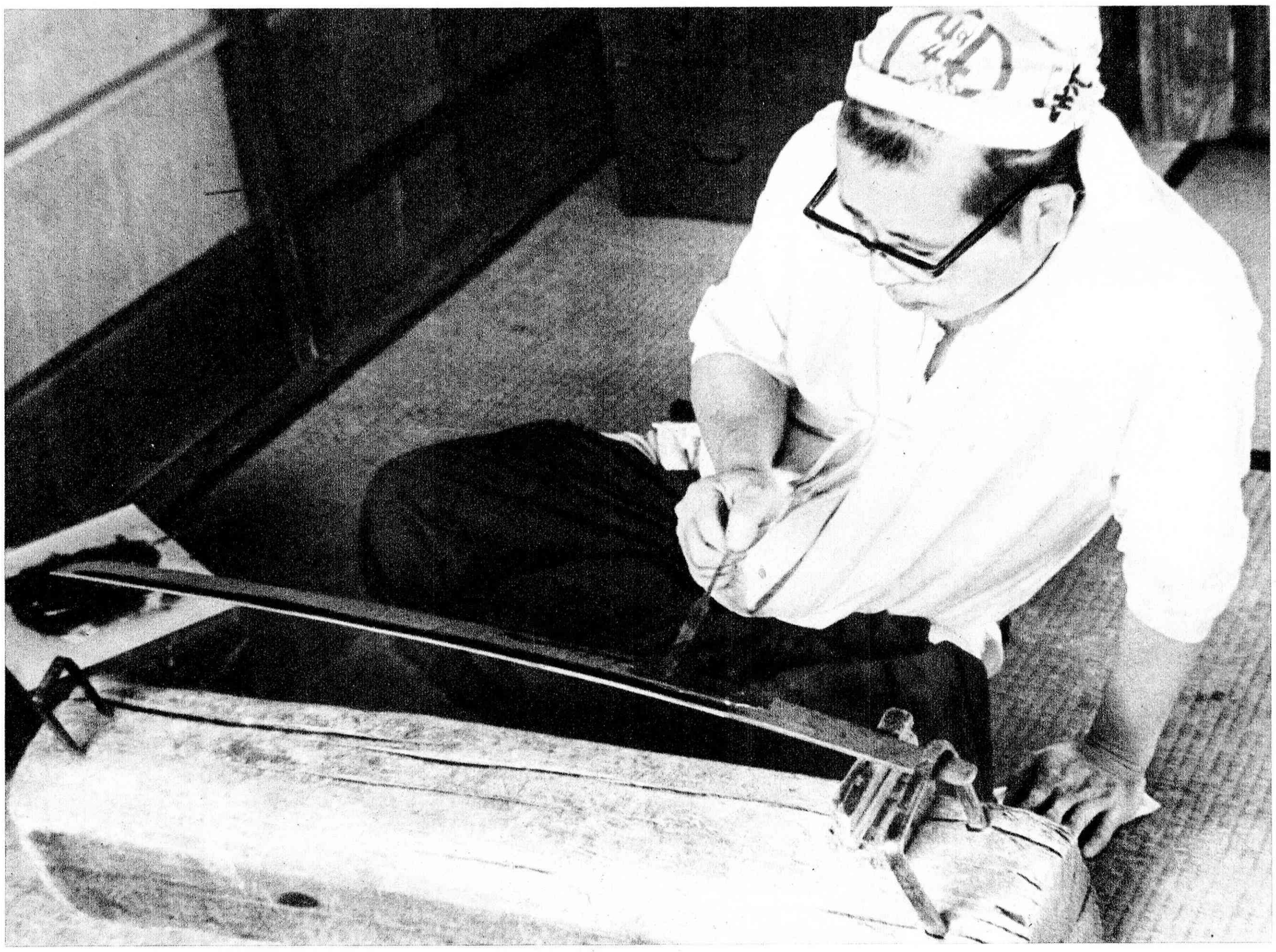
master swordsmith SHOHEI MIYAIRI

Text by TARO YAMATO

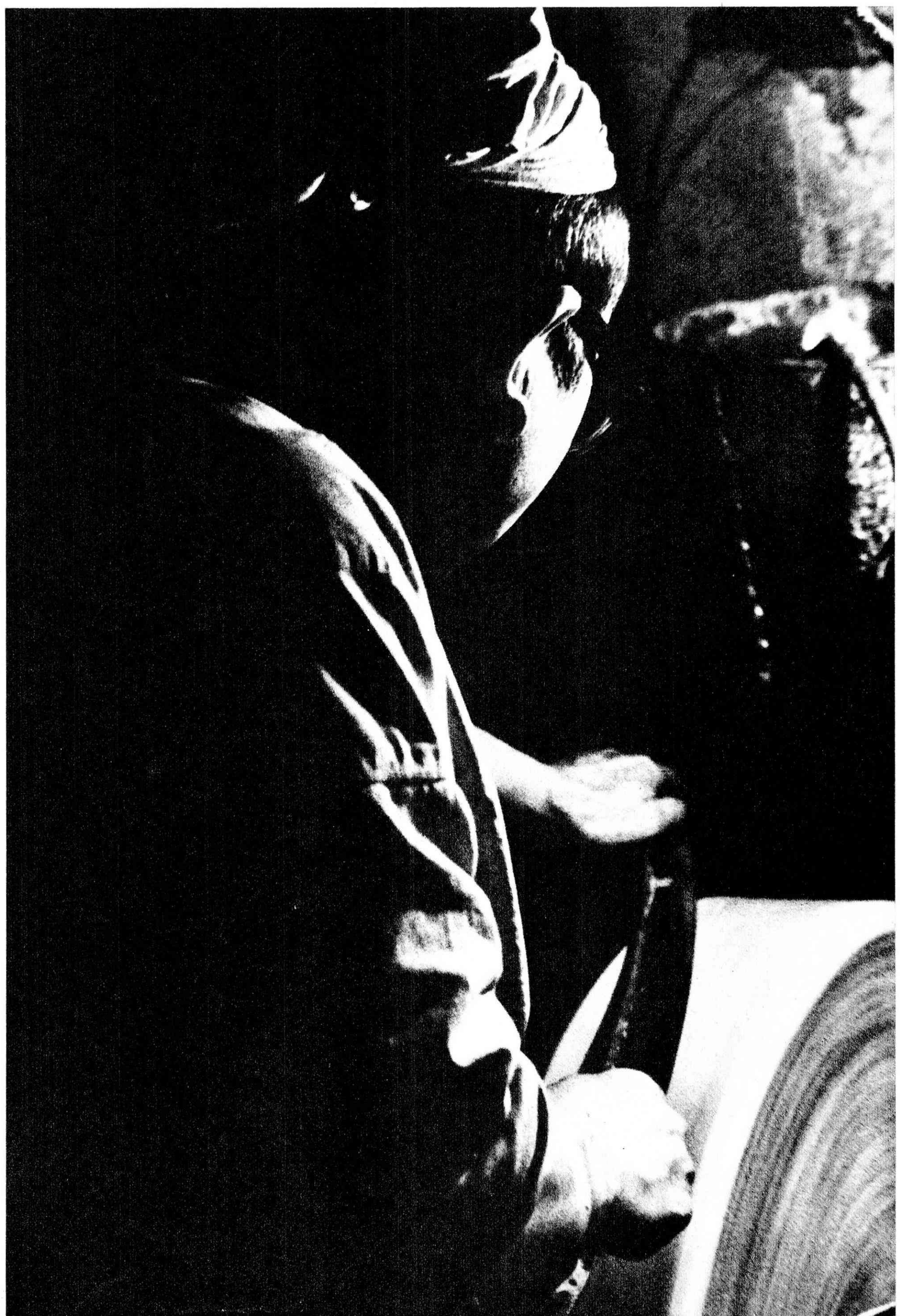


Shohei Miyairi, fifty-five, is now second to none in the manufacture of Japanese sword.

Photographs by NORIHIRO WATANABE



After sword takes shape, the tempering process begins. Specially processed mud is spread along the blade in the desired pattern of edge. It is then heated in the fire and suddenly cooled in cold water. The sword patterns are formed through a chemical process during the tempering stage (above and opposite page). Miyairi whets the surface of the blade using a rough whet stone (right). After this, the blade is polished until the pattern on the blade comes out in all its brilliance by a master polisher.







In 1913, Miyairi was born to a blacksmith in Sakaki Town, Nagano Prefecture. His father and uncle were making hatchets, sickles and other farm implements at a workshop, set up by his grandfather. Since he was the eldest son and displayed great skill, his father hoped that he would eventually take over the workshop. But as he grew up, Shohei came to aspire to be a swordsmith. So, at the age of 21, he came to Tokyo with his father's permission and became a disciple of Hikosaburo Kurihara.

Kurihara was a member of the Diet, and not a swordsmith, but deeply concerned about the waning techniques of making Japanese swords, he set about reviving the traditional craftsmanship. To that end, he established a private training institute in Tokyo for Japanese swordsmiths. He invited a few excellent swordsmiths as instructors and enrolled young trainees. The training institute was not a school in the modern sense of the term. Kurihara not only provided charcoal, iron and other necessary materials and footed all the bills for the institute, but also took orders for swords and delivered them to customers.

It was a sort of boarding-house school based on apprenticeship. When Miyairi enrolled, there were already several senior apprentices. At first, he could not receive training in sword-making, and spent every day running errands and cutting charcoal. As time went by, he gradually learned the sword-making techniques while watching the instructors and senior apprentices at work, and came to be used as *sakite* (assistant swordsmith). At the same time, he earnestly studied by himself how to improve his skill. In other words, the institute employed Japan's age-old system of training apprentices. The most basic factor in sword-making is to produce iron material of superb quality. Miyairi applied himself to creating superior iron material by reprocessing old iron goods, such as used nails and the crowns of ancient helmets.

One day, he made a sword from this iron material, and it showed a surprising workmanship. When entered in a Japanese sword exhibition, the sword won the highest award. With this as a turning point, his skill greatly improved. As Japan plunged into World War II, he manufactured military swords by order of the army. But he refrained from making numerous swords at random, and continued tireless efforts to produce better iron.

After the end of the war, a total ban was clamped upon production of swords. This compelled him to turn to the manufacture of farm implements for a living. His livelihood in the ensuing five years, it seems, was considerably difficult. In 1950, the Occupation Forces granted a special permission for the manufacture of swords to be dedicated to the Ise Grand Shrines as sacred treasures. This came as a great delight for Miyairi, who until then had been spending a gloomy life. Recalling his pleasure at the time, Miyairi says, "I felt as if I were in the seventh heaven!" Ten swordsmiths were chosen for the job to make a total of 62

swords. Miyairi made seven of them. As he had stayed away from the task of sword-making for several years, it was far from easy to restore his former skill.

In 1951, Japan signed a peace treaty in San Francisco, but the ban on sword-making persisted. In 1953, the related law was so revised as to permit the manufacture of swords provided the consent of the Cultural Property Protection Commission was obtained. For it was considered necessary to preserve the sword-making technique, which represents a time-honored craftsmanship peculiar to this country. In 1955, the Sword Preservation Association held a special exhibition of new swords, made by swordsmiths approved under the revised law. Of the swords displayed by 100 swordsmiths in all parts of the country, Miyairi's work was awarded a special prize after strict screening.

From then on, this exhibition took place annually, and Miyairi's swords continued to win the highest prize. And his unflagging efforts saw his skill improving year by year. In recognition of his exquisite craftsmanship, the Cultural Property Protection Commission designated him as the holder of a technique that is "important intangible cultural property" or "living national treasure" as the holder is generally called. He is now second to none in the manufacture of Japanese swords.

Nevertheless, he still never relaxes his research efforts. He is constantly conducting new experiments—for instance, production of iron from iron sand by the same method ancient ironmasters employed, and resmelting of old ironware. He is an amiable, broad-minded man. As may be seen from his looks, which exude an atmosphere of tranquility and unlimited broadness, he leads a very sincere life. Several trainees live with him to undergo his warm but rigorous training. Among them is an American youth by the name of K. Austin.

About 130 years ago, two brothers, Masao and Kiyomaro Yamaura, lived as swordsmiths only about 25 kilometers from Miyairi's present home. Both were men of character and produced fine swords. Miyairi's primary target has been to emulate the works of the two swordsmiths, who are the pride of his native place, and to improve his own works up to their level. Nowadays, however, he has already excelled them, coming close to the standards of the masterpieces of swordsmiths of ancient times.



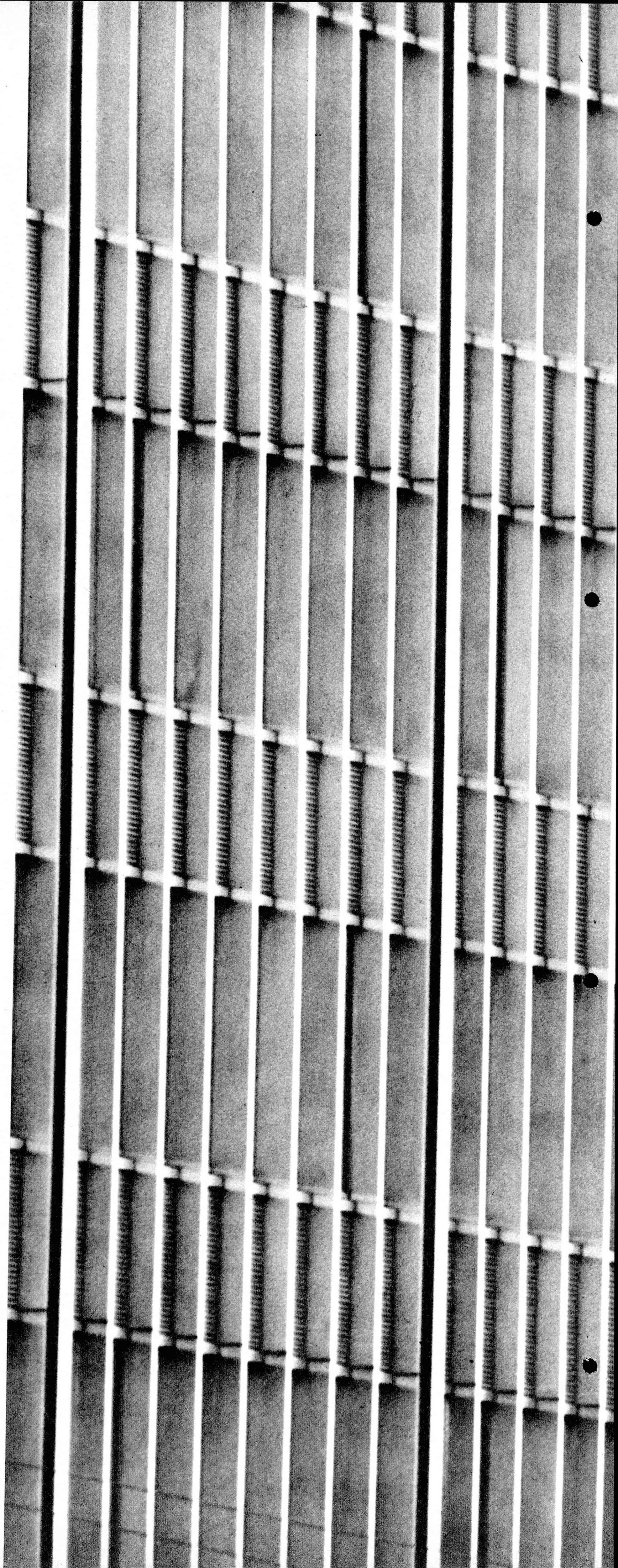
Each of the dozen or so swords he produces each year has come close to the standard of the masterpieces of centuries long past.



Shohei Miyairi at the forge. He dresses like his medieval counterpart and uses strictly traditional methods and materials to produce excellent swords.

NEW COMPOSITION OF URBAN PICTURE

TOKYO 1968: ITS TWO FACES



In the sky, on and under the ground of mammoth Tokyo, fresh contours of the urban face are being created day after day. Skyscrapers present incisive silhouettes against the sky, while entrances to underground shopping centers draw geometrical figures on the ground.

A city is like a living thing constantly undergoing metamorphoses to meet the needs of the times. And this is especially so in Tokyo. This gargantuan city is indeed an immortal organism marked by brisk metabolism and metamorphosis.

Structures emerging daily are giving birth to fresh compositions and beauty hitherto hardly imaginable. This is in response to overriding impulses for more functional places for work, more comfortable places in which to live and pursuit of still greater profits. In other words, such fresh urban compositions and beauty represent the replies of architects, technicians and artists in the 1960's to the ever vigorous desires of the general public, which dominates sprawling Tokyo. They also symbolize the latter half of the 20th century—to wit, the age of iron, plastics and cement, the age of computers and automobiles, and one that may witness man-created machines eventually controlling matters for man, their master.







FRESH COMPOSITIONS BY NEW BUILDINGS

New modern structures appearing in Tokyo one after another come as real eye openers even for the citizens living in the mammoth Metropolis. Left: Literally towering from a generally low skyline of central Tokyo is the 36-story "Kasumigaseki Building." Rising 147 meters above ground, the building with beige outer walls and heat ray-absorbing gray windowpanes has not only brought an entirely new contour to the face of Tokyo, but also shattered a long superstition that such buildings cannot be erected in Japan, a country noted for frequent earthquakes. The structure truly stands as testimony to the triumph of modern technology, acquired by Japan over the past century, in the sphere of architecture. Right: Wall surface of a new building in Shinjuku.



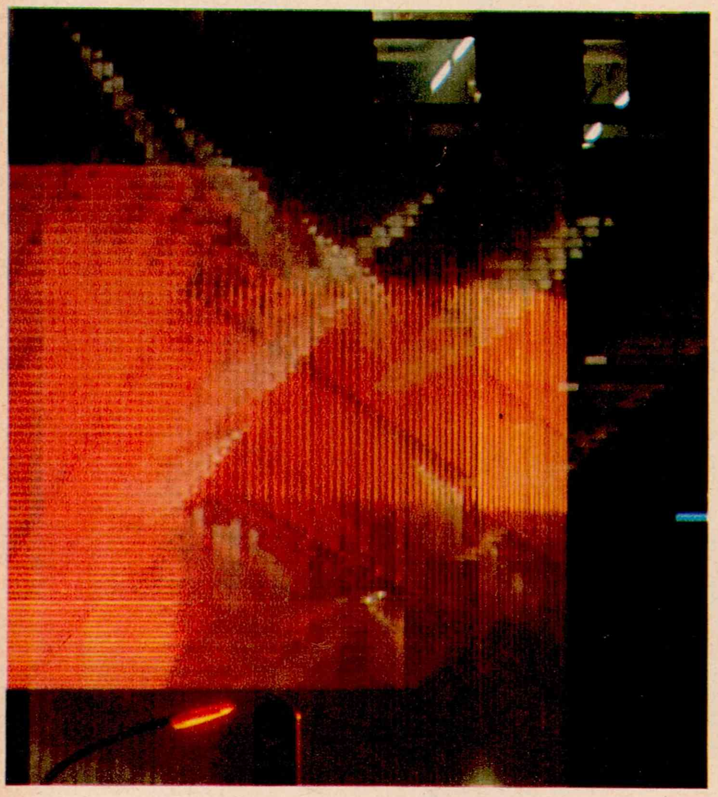
GEOMETRICAL CONTOURS OF URBAN FACE

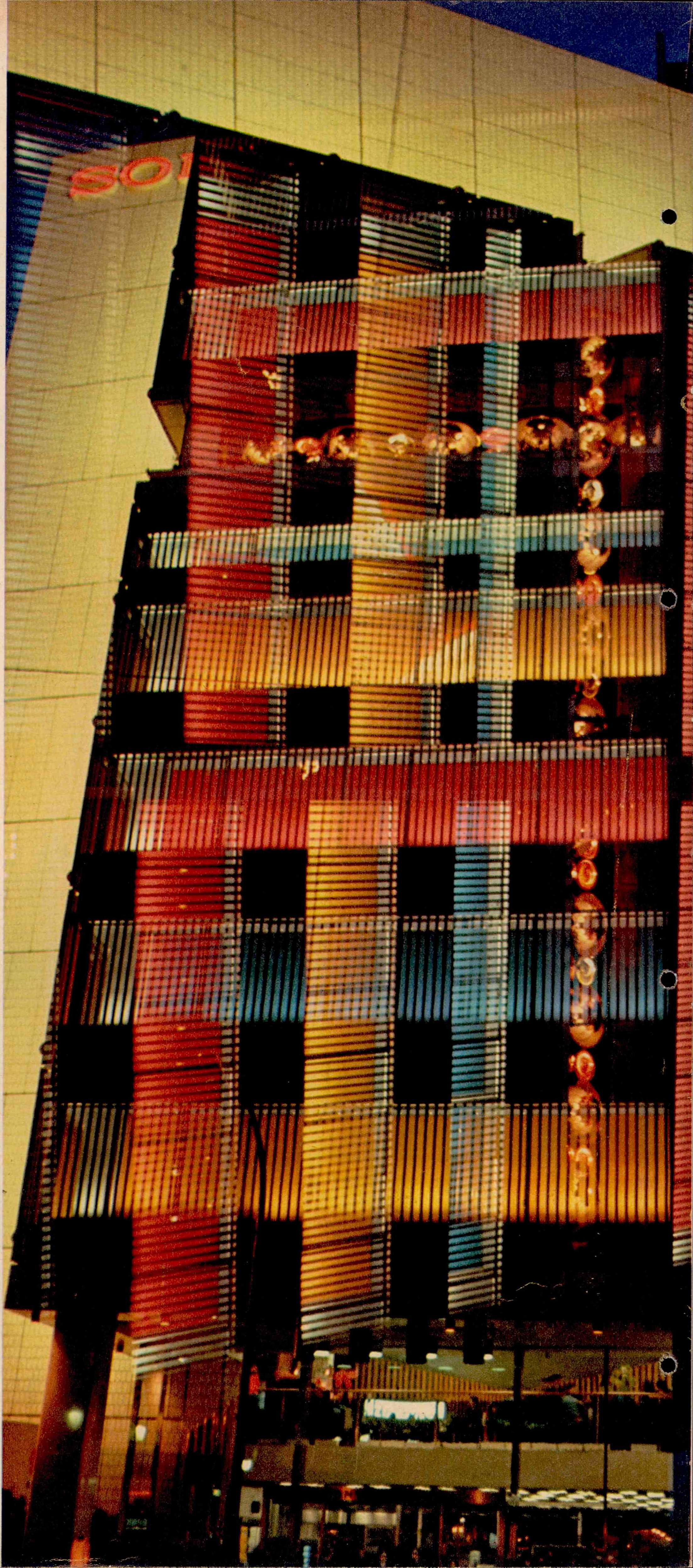
Interlacing arteries of iron and cement cutting sharp figures against the background of the evening sky—the Metropolitan expressways slash their ways through Tokyo, grazing past high buildings, jumping over houses and piercing into the ground. The network of straight and curving speedways has added totally fresh forms and beauty to the Metropolis (right photo). Tokyo is also spreading its roots under the ground, as instanced by a network of subways, underground shopping centers and parking lots. Tokyo, now in process of metamorphosis, has sought one of its new places of prosperity under the ground. Of course, Tokyo has had subways and underground shopping streets for years. In the past, however, they were nothing more than "supplements" to the city on the ground. But now that the congestion of Tokyo is reaching the limit, the underground facilities are no longer mere "supplements." They have already assumed such proportions that even the description "independent underground city" may well be considered in order. And with its independence, this "underground city" has unfolded one fresh urban composition after another before our eyes. Left photo shows the entrance to the "underground city" in Shinjuku.



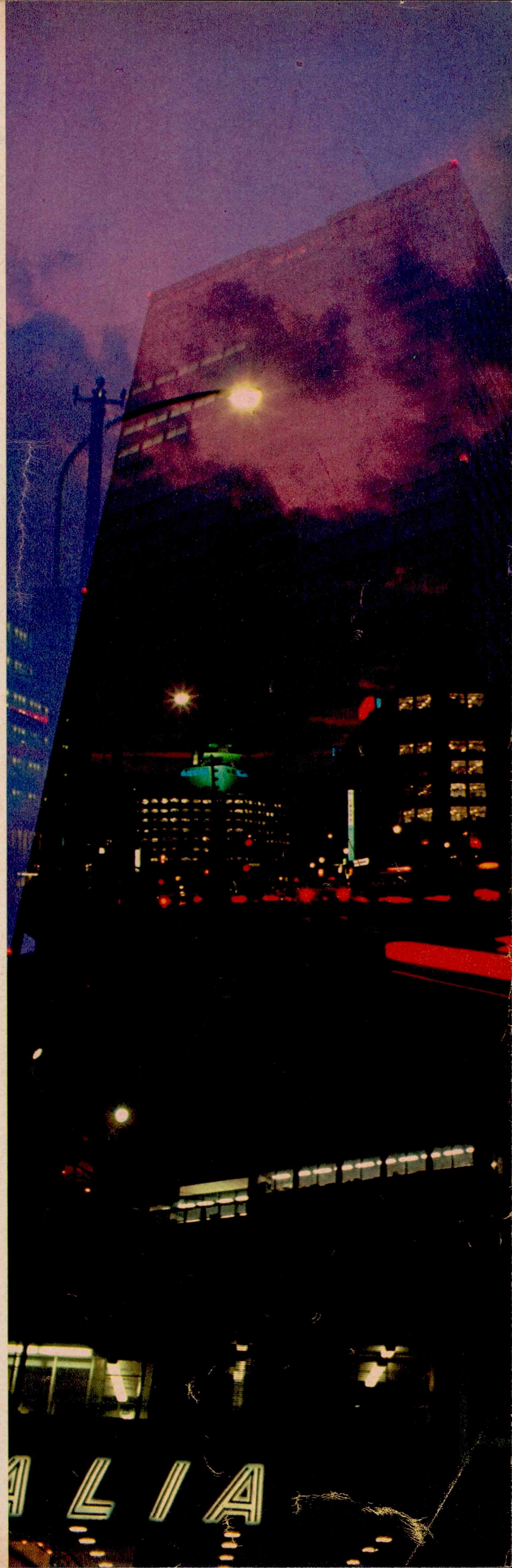
A VERITABLE SYMPHONY OF LIGHTS

At night, the wall surfaces of buildings in Tokyo's bustling commercial quarters present another kind of new urban beauty. In the daytime, their exterior walls, lavishly inlaid with big windowpanes, show off their functional beauty under the sun. But the fall of night brings a complete change in the picture. A veritable symphony of lights through ingenious combinations of primary colors never fails to delight the eyes. The symphonic effect is multiplied by the mingling of lights emitted by walls with the reflections of those from other buildings. These photos present a multicolored image of the walls of buildings at night by means of multiple exposure.






SONY


ALIA



The spacious underground plaza at Shinjuku.

URBAN CONGESTION
TOKYO 1968: ITS TWO FACES



Commuters' crush: Shinjuku Station.



Aerial view of downtown Tokyo.



EXCESSIVE CONGESTION: MOTIVE POWER OF METAMORPHOSIS

If the mushrooming of multi-story modernistic buildings of novel designs is considered one face of Tokyo in 1968, excessive congestion forms another.

Tokyo is an overly congested city. Roads are crowded with diverse vehicles, while electric trains during rush hours bulge with so many commuters hurrying to central Tokyo that you may even wonder why the coaches do not burst at the seams. On holidays, playgrounds and amusement centers are packed with countless citizens. An aerial view also shows central Tokyo covered with a motley of office buildings and houses. University entrance examinations attract scores as many applicants as the number to be admitted. And at lot-drawings to determine the occupants of public apartment houses built at conveniently located sites, only one out of every 1,000 applicants can hope to be successful.

Nothing such an imbalance—that is, coexistence of ultra-modern buildings and various phenomena of excessive congestion, a certain scholar contends Tokyo should rather be called a "village" than a city. Excessive congestion can in no way be considered a comfortable state for human beings. But this congestion is the very motive power that renders Tokyo's dynamic metamorphosis possible. That is, it is the very expression of the energy and vitality of the 11 million citizens living in this sprawling Metropolis.

In Tokyo, it is not that automobiles here increased since new roads have been built. The fact is that new roads are built because rapidly increasing vehicles choke old roads. Even while scholars and officials are racking their brains over city planning, Tokyo never ceases to grow and change. Various plans to alleviate congestion have been mapped out, accompanied by tremendous investments. But the congestion still persists. For there is not a single let-up in the expansion and metamorphosis of Tokyo. And the vitality of the Japanese people, and the energy of the economy never allow Tokyo to rest even for an instant.

As long as the phenomena of excessive congestion prevail, Tokyo will continue to undergo constant changes, which will give birth to new structures. And these structures will create new forms and beauty in the picture of the capital, but at the same time, they will give birth to new types of congestion. Eventually, they will be dismissed as outmoded, demolished and replaced with new ones by the same people who have created them—that is, the general public dominating this mammoth Metropolis. For Tokyo is a city which, supported by unbounded energy as expressed in the phenomena of excessive congestion, keeps on growing while carrying out destruction and construction at the same time. If Tokyo should become completely free of congestion, it would be when it is a city of the past.



Excitement of a race stand on Sunday.

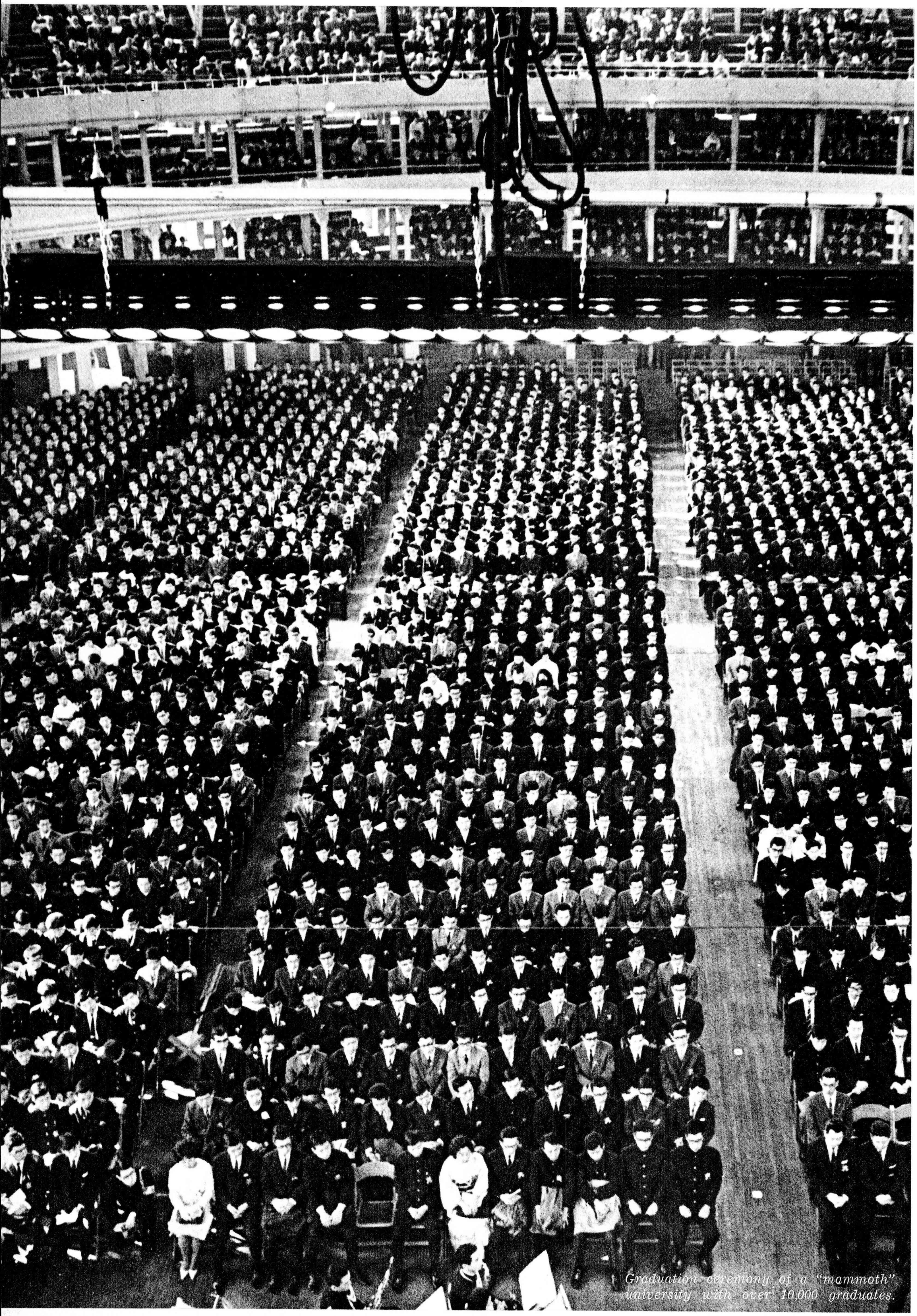




Morning of a vegetable market.



Main streets are deluged with diverse cars.



Graduation ceremony of a "mammoth" university with over 10,000 graduates.

BRINGING UP GORILLAS

zoo attendant RIKIZO ASAI and his three "children"

Photos by TAKASHI OISHI

THREE giant gorillas, named Gonta, Puppy and Oki, with a combined weight of 450 kilograms, are being brought up happily at the Nagoya Zoo in central Japan. Well tamed, they play musical instruments, perform weightlifting and do many other humorous tricks to the delight of visitors to the zoo. The biggest of the trio is Gonta, a male gorilla weighing 190 kilograms, while Puppy, a female, is nimble and clever enough to constantly think up new games. Miss Oki is a glamour type of a relatively small build.

Any group of gorillas is dominated by a boss to whom its members never fail to be absolutely obedient. And this natural habit is firmly observed by the three gorillas in spite of their being reared in an artificial environment. Well then, you may say, Gonta, who is apt to behave violently, must be the boss. But the answer is negative. And of course, neither of the two females, Puppy and Oki, can lord it over the male Gonta. The one who leads the three gorillas as an absolute boss is a zoo attendant in charge of them. When scolded by the boss, the three get so crestfallen that one cannot but feel compassion. But when given a pat on the back, they get elated, and drum their chests with both fists.

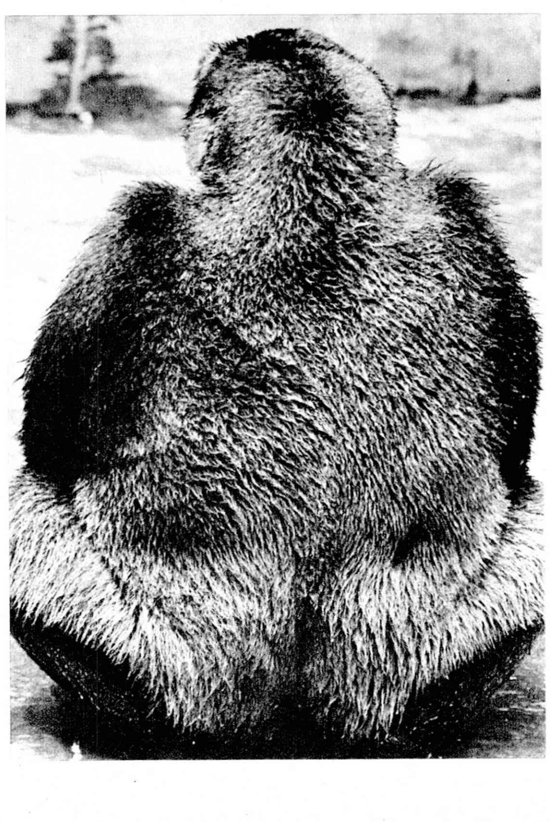
This "almighty" man is Mr. Rikizo Asai, 45, a veteran attendant of 27 years at the Municipal Higashiyama Zoo in Nagoya City. For years, he was in charge of rearing hippopotamuses, elephants and reptiles. Exactly 10 years ago, he was suddenly assigned to take care of anthropoids, parting from the elephants then in his charge. The anthropoids kept at the zoo at the time were chimpanzees and orangutans. Two years later or in September 1959, they were joined by three gorillas —the first animals of the kind to be kept at the Nagoya zoo. The gorillas—one male and two females—had been captured in equatorial Africa and brought all the way to Japan. That day's entry in the diary of the Anthropoid Shed says:

"(September 8, 1959) Three gorillas arrived —Gonta, male, one year and a half old (weight: 8.5 kilograms), and Puppy and Oki, both females aged two, weighing 11.5 and 11 kilograms, respectively. They drank very little milk from feeding bottles. Gonta, apparently feeling lonely at night, clung fast to me, crying, when I was about to leave the cage. The two females slept hugging each other."

Day in and day out, Mr. Asai was absorbed in taking care of the gorillas. In 1960, he separated from the chimpanzees and orangutans, and became an exclusive attendant for the gorillas.

Contrary to the general impression, gorillas are very timid, nervous animals. If moved to a different place or if an unfamiliar thing or sound comes to their attention, they get too scared to eat, and moreover, develop diarrhoea. In Japan, there are few records and data available regarding the rearing of gorillas. So Mr. Asai had a great deal of difficulty in preparing meals for them. A gorilla, formerly kept at the Monkey Center, soon died because it would not eat anything but banana stalks.

Mr. Asai first tried to give eggplant, cabbage, bread, apples and carrots. But looking at them suspiciously, they would not come near the food. Every day, he himself ate the food in front of the gorillas and even fed them from his mouth. By and by, they started eating by themselves. When other attendants came and patted the gorillas on the head, the animals became frightened. They were thus very afraid of strangers. In particular, Gonta would not let Mr. Asai go by clinging to him day and night, embarrassingly obstructing him from attending to his duties. When he went on the scale with the gorillas in his arms one by one to measure their weight, they were greatly shocked by the swinging needle of the scale.



At any rate, the three timid animals were able to live a peaceful life as long as Mr. Asai was beside them. Whenever he spent a long time in feeding the especially nervous Gonta, Oki and Puppy later bullied Gonta out of jealousy. Suffering from a cold, loose bowels or eye disease, or sustaining bruises in fights from time to time, the three gorillas grew up year after year. After six years, all of them exceeded 100 kilograms in weight. Their living quarters consist of a 30-square-meter room, used for both sitting and sleeping, plus a playground equipped with a swing and trees for climbing.

Mr. Asai fully realized that he is the boss for the three gorillas. Since the animals became four years old, no attendants other than Mr. Asai have ever entered their cage. Even when young atendants tried to give milk from outside the cage, the gorillas would not come near. Once on such an occasion, Puppy approached the man holding out a milk bottle. It was quite an unusual thing, but suddenly, Puppy blew a mouthful of milk upon the attendant's face. The gorillas are obedient only to Mr. Asai and faithfully follow his instructions.

WHAT surprised Mr. Asai was the gorillas' fear of unfamiliar things and sounds, and their stubborn refusal to get used to them. The sounds of automobiles and road work, TV camera seen through the glass window, and each new tool brought into their room or playground—all of these frightened them so much that they actually jumped to their feet, and crying loudly, clung to their boss, Mr. Asai. On such occasion, he had to gently stroke them on the head and body, loudly talking to them, "Why, show your nerve like a real gorilla that you are!"

To soften their shock at the sounds of the outside world, Mr. Asai hit upon the idea of using a radio. He left a transistor radio on in the gorillas' room. Soon they showed indifference to sounds other than voices of animals and sound of automobiles. It appeared that their feeling was calmed by rythmical music.

The best way to mitigate the gorillas' fear of unfamiliar things was for the boss to show an example. When a TV camera was brought to broadcast their life, Mr. Asai first approached the camera, and tapped and licked it tenderly. Observing their boss fearlessly touch the camera, the animals clearly felt much relieved. They also made quite a scene when the concrete tree for climbing was first brought into their playground. As soon as the tree arrived, they cried loudly and asked to be taken back into their room. Mr. Asai climbed the tree himself, stroked and licked it, and then called out, beckoning them to come. First suspicious, they approached reluctantly, examined the tree closely, and gradually got used to it. But on the first day, as soon as the door to their room was opened, they dashed back into the room and promptly lay down, showing great relief.

ON the night of the day such a "shocking" incident occurred, the three gorillas used to gather around Mr. Asai, trying to prevent him from leaving the room. When he shook them off and got out, the giant animals, more than 100 kilograms each in weight, clustered together by the door, apparently waiting for Mr. Asai to come back. It was indeed a pitiful sight. When they realized he would not return, Gonta, screaming loudly, used to tumble about on the floor as if to dispel grief from his mind.

The three gorillas may well be described as all too human. They take keen interest in whatever their boss does. When Mr. Asai smokes a cigarette, they pull his hand, holding a cigarette, to their mouth to enjoy a puff. When a spectacle frame is given, they scramble for it. Catching it, one of them tries to wear it just like Mr. Asai, but cannot put both ends of the frame on its ears, and so, just puts it on the head, showing an air of pride. It is a very amusing sight. Envious, the two other gorillas try to steal the spectacle frame, resulting in a fight. In that case, only a reprimand from the boss can end their quarrel.

And how are the "human" relations among the three gorillas here? At first, Puppy and Oki apparently felt like sisters or mother and daughter to each other. But as Gonta and Oki became attracted to each other as male and female, trouble was apt to occur, since even when Puppy invited Oki by gesturing to come and play, the latter would not comply. Oki apparently found herself in a difficult position, as she had to choose between Puppy and Gonta. To save her from such an embarrassing situation, Puppy was once removed to a different room. But this made all of the three so sad that they would not even take meals. Sometimes, Oki tries to please Puppy by even offering her own milk and tomato.

Mr. Asai stays in their room for about an hour until they fall asleep, whenever he can spare time. Gathering around him, they go to sleep, taking various postures they like. Gonta sits down between his legs, while Oki leans against his back and Puppy lies with his leg as pillow. Greatly relieved, they fall asleep while playing with the pockets of his coat, his boots and a towel on his head.

Capitalizing on his position as boss, Mr. Asai started to teach the gorillas to do various tricks about three years after they arrived at the zoo. First, they learned to squat down at the command of their boss. Then they became able to sit on chair and use forks. They have also learned to play simple percussion instruments, bugle and harmonica as well as to stand on their head and dance a "twist."

Combining these and other elaborate tricks, Mr. Asai started to present the "Gorilla Show." The black, imposing 150-kilogram figures, skillfully combined with "human" tricks, draw guffaw after guffaw from the audience.

The reason Mr. Asai has the gorillas perform the show is his earnest desire to have people know the very humorous, amiable character of gorillas, which cannot be observed if they are confined to a cage. He also believes the show serves to keep the gorillas always aware of the fact they must obey their boss. In fact, a very humorous charm is felt when you see Puppy and Oki clapping their giant hands for Gonta's successful weightlifting, while a proud Gonta drums his breast with both fists. You cannot expect such charm from other animals.

One of major reasons Mr. Asai maintains his status of trusted boss is his big target of making a possible birth of gorilla baby successful. It is known that a mother gorilla, after giving birth to a baby, gets extremely excited and unruly. To ensure a smooth birth and baby nursing, the attendant must have the absolute trust and obedience of the animal he handles. Mr. Asai hopes his constant contact with the gorillas by having them do various tricks will make this possible. The "Gorilla Show" is but a means of achieving this, he says. Recently, he feels, Gonta has started to show signs of taking a threatening attitude even toward the boss. Therefore, he thinks, the male gorilla must be handled with caution.

OF late, Mr. Asai has begun swinging a wooden sword in front of the gorillas while he spends about an hour together with them until they fall asleep after supper. The idea is to keep them in awe of the boss. Each time he swings down the sword with martial shouts, Puppy and Oki lean back, expressing a feeling of awe.

Once he brought green twigs of oak from a mountain and gave them to the gorillas. Vocally expressing great delight, they seemed fascinated by the smell of the twigs and green leaves before they ate them. As if they were drunk, they danced about, reeling and swinging the twigs over their heads with eyes half closed. This made Mr. Asai think that their yearning for nature might be growing gradually although they themselves did not know it. "Would they live a happier life in a jungle?" he wondered.

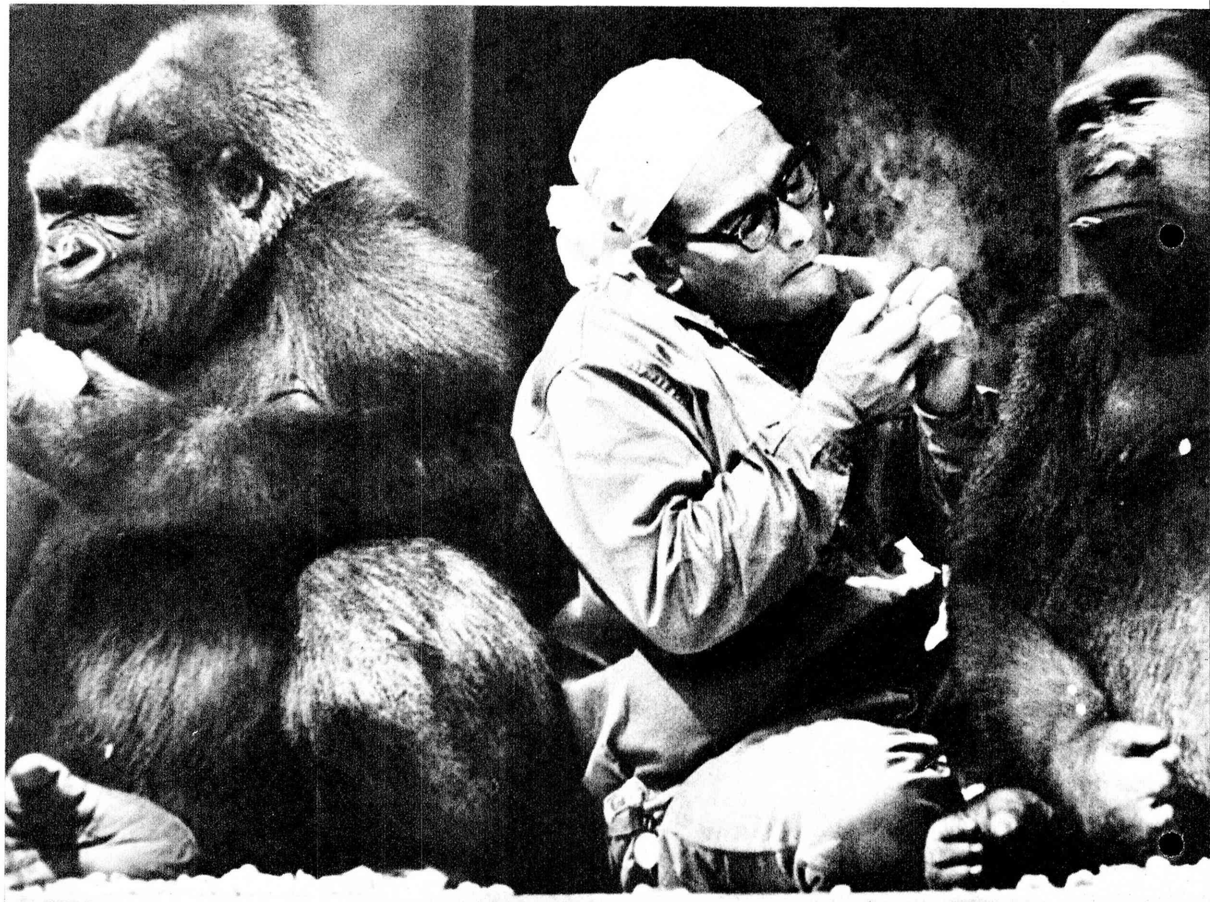
But, he thought, their parents must have been shot to death when they were captured. "If they had been left in the jungle, what would have become of them? At any rate, they are destined to live the rest of their lives—possibly more than 20 years from now—with me. Tomorrow, I'll go to the mountain again and bring them many twigs," he thought, while swinging the wooden sword as Gonta, Oki and Puppy, all leaning against the wall, watched his "strange" action, half in awe and half in wonder.

The March 10, 1968 entry in his diary for the gorilla shed says: "Gave them food they don't like when they were hungry (that is, cabbage, stone-leek, carrot, onion, etc.). When they finished eating, gave them food they like (milk, yogurt, egg, mandarin orange, apple, banana, carrot leaves, etc.). They always like to eat bread and honey, and sugar cane."



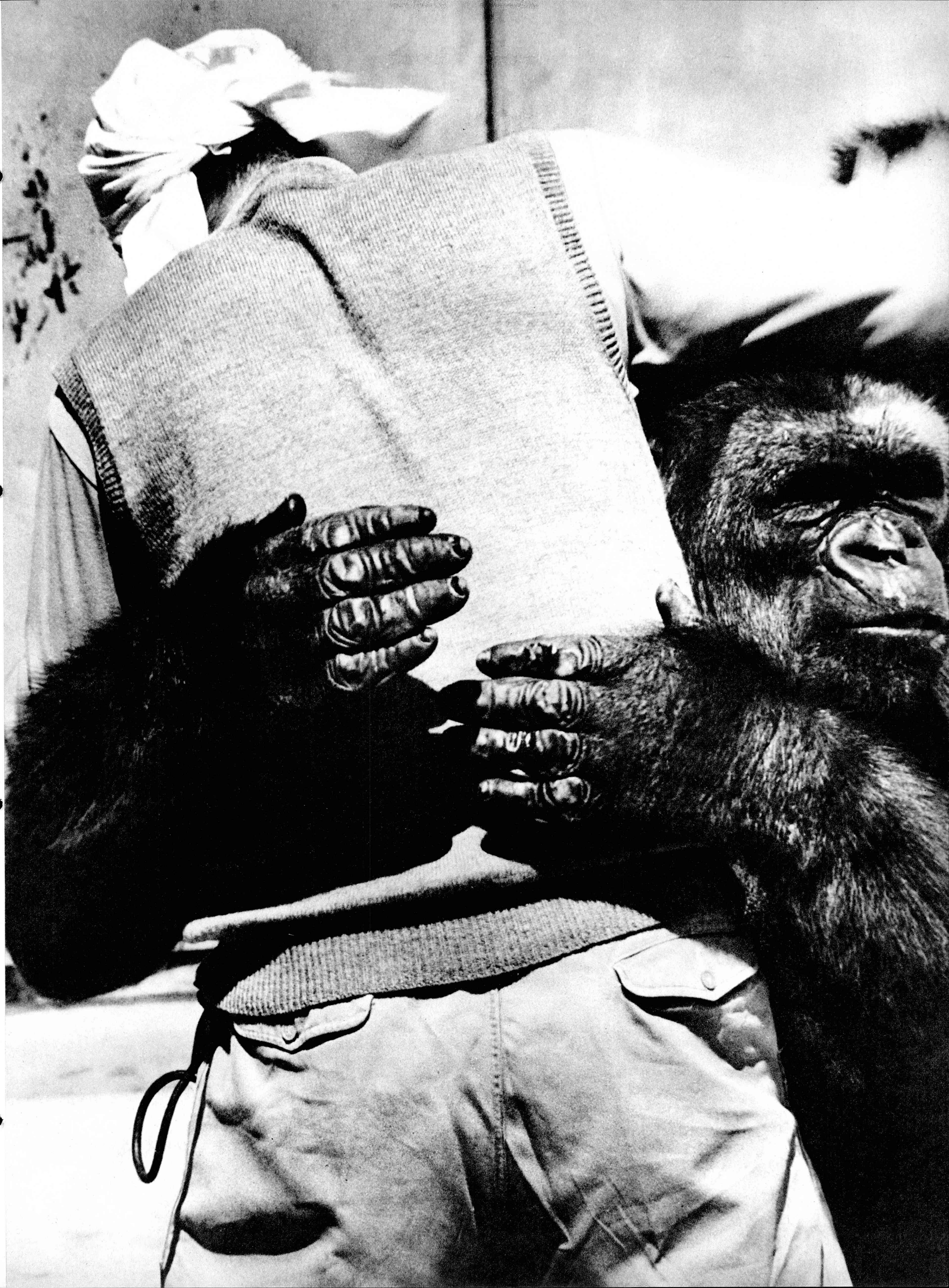


Unshakable position of the boss; it is a taboo for him to get flustered or show uneasiness in front of the gorillas under any circumstances.



Mr. Asai lives in a house provided by the zoo, located about 500 meters from the gorilla shed. His family consists of his wife and two children. Right: At rest after supper. Opposite page: Gonta hugs Mr. Asai. Below: His three "children" go to sleep while watching him with half-closed eyes to make sure he will not leave them alone; left to right, the boss, Gonta, male, nine and a half years old (weight 190 kg.), Puppy, female, 10 years old (120 kg.) and Oki, female, 10 years old (137 kg.).





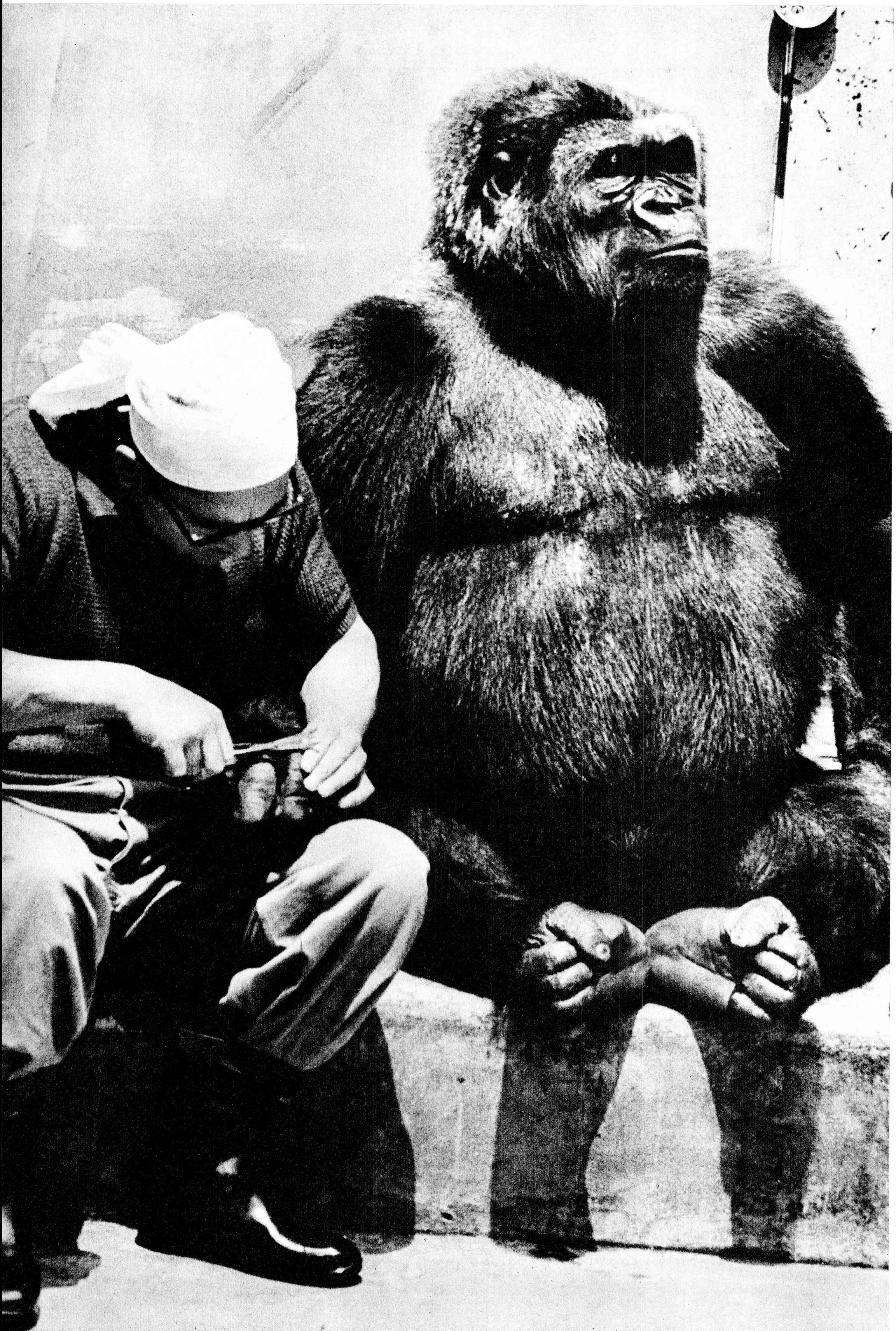


Left: Waiting for food. Below: Gorilla Show. The gorillas must obey the commands of the boss, whether they like it or not. Bottom: Oki fascinated by twigs of oak tree. Right: Puppy loves to sport with water.









Wouldn't their nails grow in the jungle? Gonta proudly offers his hand for nail clipping.

HAMAMATSU: TOWN OF PIANOS

Japanese-Made Pianos Likely to Dominate the World

Hamamatsu on the shore of the Pacific Ocean with a population of 420,000 is a town of pianos whose products now pervade in all parts of the world.

Last year, Japan turned out 194,000 pianos or second only to an estimated 230,000 units in the United States. But the pace of production growth to date makes it certain that Japan will replace the U.S. as the world's biggest producer of this musical instrument. Hamamatsu accounts for as much as more than 90 per cent of Japan's piano output. So it is not too much, therefore, to call Hamamatsu the piano center of the world.

Then what has caused Hamamatsu to become the town of pianos? And what has enabled Japan to produce pianos, a Western musical instrument, in such large numbers and elevate quality to the level of European-made pianos boasting two centuries of tradition?

Let us go as far back as 80 years ago. In 1887, teachers and pupils of the Hamamatsu Primary School were utterly disconcerted. For a reed organ imported from the U.S. broke down. In those days, an organ was still a rarity, and many people flocked to the school just to take a look at the musical instrument. Naturally, therefore, not a single piano repairman was available. Nonplussed, the school authorities consulted Mr. Torakusu Yamaha, known to be experienced in repairing timepieces and other machines. He carefully examined the mechanism of the organ, found what had gone wrong, and did a remarkable repair job. This small event was the very beginning of Hamamatsu's growth as a town of pianos. **Continued on Page 54**



After assembling, a piano is applied to an automatic action testing machine to insure the smooth movement of action mechanism.



The biggest factor behind the phenomenal advance of Japan's piano industry was the successful development of the mechanized mass production system. Today, few skilled hands are necessary except in the last stage of tuning and inspection. Above: A spacious grand piano assembling room. Below left: A young worker assembles the keys of a grand piano. Below right: Final testing is done in a special sound room. All photos were taken at the Nippon Gakki's Hamamatsu plants.











Fascinated by the elaborate mechanism of the organ, Mr. Yamaha made up his mind to make organs in Japan. On the basis of knowledge obtained through the repair work, and with the cooperation of the Tokyo School of Music, he came up with the first Japanese-made organ in 1889. Then in 1897, he established the Nippon Gakki Co., known for its YAMAHA brand, and set about making a piano on the basis of his experience in organ manufacture. And in 1899, the first piano ever to be made in this country made its debut.

In 1927, Mr. Koichi Kawai, who had till then been working for Nippon Gakki set up the Kawai Musical Instrument Manufacturing Co. to produce pianos. Hamamatsu's reputation as a town of pianos has steadily grown parallel to the development of these "Big Two" piano manufacturing companies.

Yet it was during the past 10 years that Japan's piano industry made prodigious strides to the astonishment of the world's musical instrument industry. The nation's piano exports, which stood at only 794 units in 1958, soared to 31,600 units in 1968. Export pianos consist mainly of high-class models, centering on grand pianos. These are destined for numerous nations all over the world, such as the U.S., Britain, France, West Germany, Italy, Canada, Australia, New Zealand, the Republic of Korea, the Philippines and Mexico.

The biggest factor behind such a phenomenal advance was, in a word, the successful development of the mechanized mass production system, which was considered impossible in Western countries. And one glance into the factories of the top maker, Nippon Gakki, makes this all too evident. The company has five specialized plants—the Tenryu Plant making wood parts, the Iwata Plant producing metal parts, the Miyatake Plant manufacturing action parts, the Kakegawa Plant for assembling upright pianos and the plant of the head office for assembling grand pianos. Each is almost fully automated.

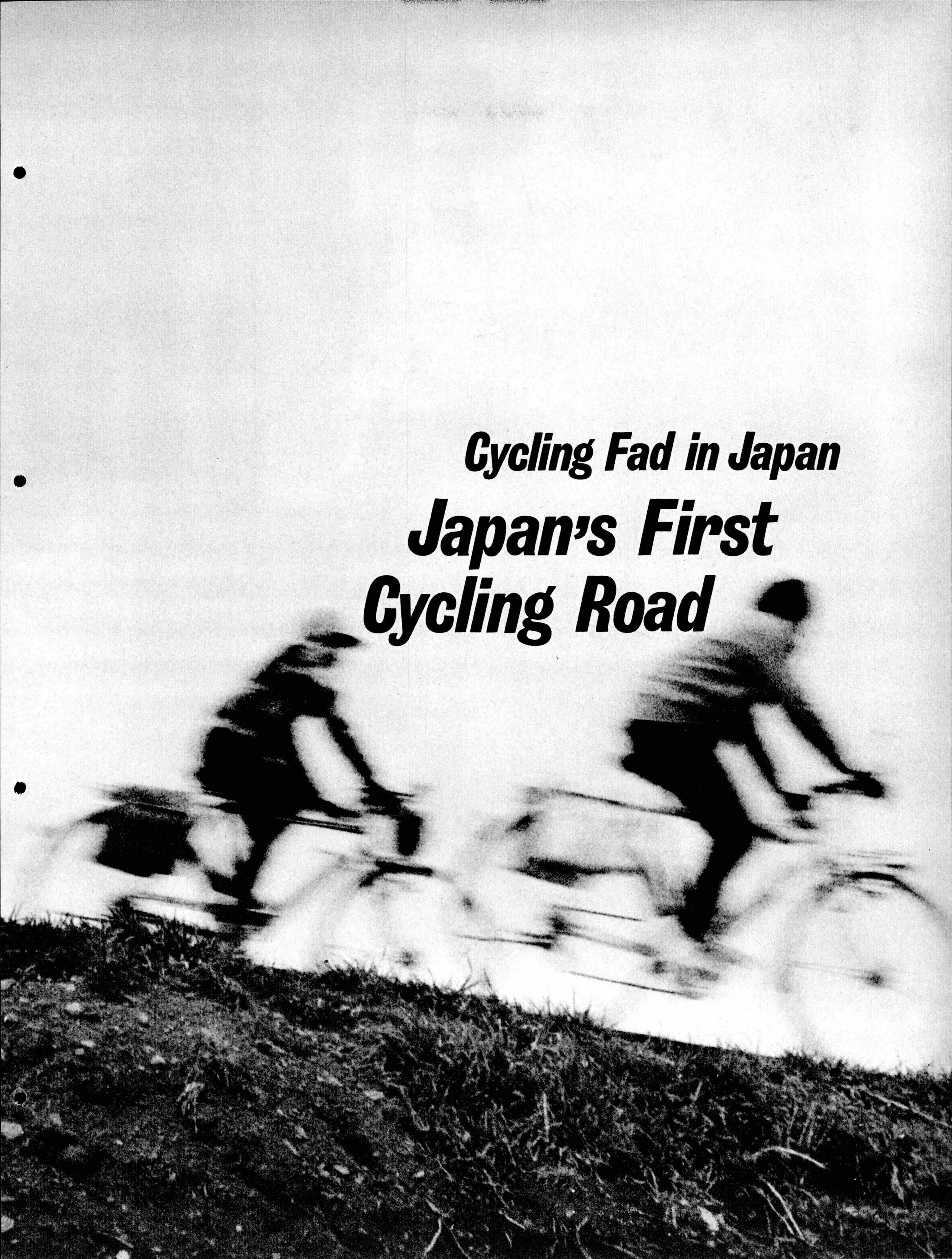
At the most modern Kakegawa Plant, assembled pianos move slowly on the conveyor. Female workers, employed only two or three years ago, adjust the height of the hammers and tighten tuning pins. Tuning is done visually with the oscillograph. Various production stages, manned by only skilled workers in the past, are now mostly mechanized, reducing flaws to a great extent. As a result, few skilled hands are necessary except in the last stages of tuning and inspection.

The superb performance of Japanese-made pianos has already been testified by distinguished foreign pianists who have so far visited Japan, such as Wilhelm Kempff and Arthur Rubinstein. They have ceased to say, "I don't play unless I get a famous German-made piano." And of course, the superior quality of Japanese-made pianos has also been corroborated beyond doubt by the steep upward curve in exports.

A veteran worker adjusts the hammer head made of woolen felt of the highest quality.

Cycling Fad in Japan

Japan's First Cycling Road



Japan's first road exclusively for cyclists has been completed and opened to the public at Hiratsuka, Kanagawa Prefecture, to the great delight of cycling enthusiasts, who are on the rapid increase.

The cycling road running along the embankment of the Suzu River in the suburbs of the city extends over about 13 kilometers with a width of 2 meters. Asphalt-paved, it stretches upstream from the mouth of the river flowing into the Pacific Ocean and commands a rich variety of views—for instance, majestic Mt. Fuji in fine weather and the New Tokaido Line, the world's fastest super-express service, with the road passing through one of its overpasses. Signposts along the road, announce among others, the speed limit (20 kilometers per hour), sharp curves ahead and distance for the starting point.

But most welcome for cyclists is the freedom from worry about heavy motor traffic, which enables them to pedal along freely, unmolested by speeding vehicles.

In Japan, cycling has grown in popularity with great speed over the past year or so as part of the so-called "leisure boom" in this country. And this is eloquently attested by the trend of bicycle sales in recent years. According to a survey by the Japan Bicyle Industry Association, the nation's production tended to level off by and large until 1965 after hitting a peak of 3,290,000 units in 1960. This was the "slack five years" as makers call it. With the advent of 1966, however, the situation underwent a complete change. Production shot up by 19.4 per cent over 1965 to 3,655,000 units. Last year, upward of four million units were turned out. Furthermore, there has been a sharp rise in the proportion of lightweight or sports bicycles production as the ratio of sturdy practical bicycles has dwindled.

In other words, although bicycles used to be an important means of living in the past, this role has now been taken over for the most part by motor vehicles, at least in urban areas. Bicycles have now assumed a new role of contributing to public leisure. For bicycles are capable of small turning area, fairly good speed, and are highly suitable for physical training. And these favorable factors for recreation, which do not apply in the case of automobiles, have come to be much appreciated. The cycling fad is especially remarkable among junior and senior high school students who are too young to own automobiles and motorcycles.







Free of worry about automobiles, young cyclists pedal along in comfort. Pedaling along is such a refreshing experience that the popularity of the cycling is bound to increase.







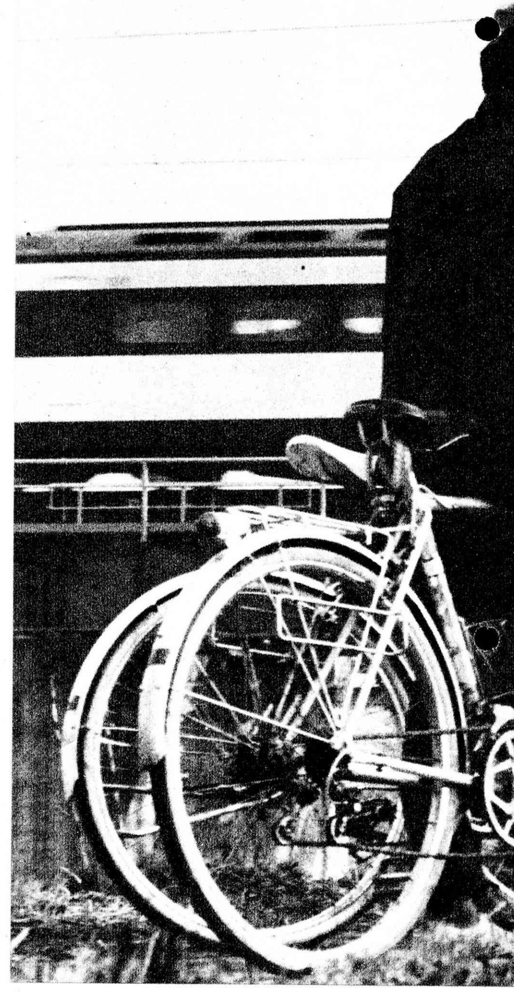
Keenly alive to the new trend of preference for sports, rather than the sturdy practical type, bicycle manufacturers have developed a series of new techniques in rapid succession, such as light frames made of alloy, slender tires, and intricate precision mechanism with a gear system attached. At present, bicycles with a 6-stage gear system, speedometer and distance meter are not uncommon. Even bicycles with as many as 18 stages in the gear system have appeared on the market.

Nevertheless, the fast growing popularity of cycling has not been without difficulties, as traffic accidents involving cyclists have become a major problem. That is, cyclists sharing the same road with automobiles are in great danger. This has given rise to a demand among cycling lovers for facilities that could enable them to pedal along without danger from automobiles. This is why Hiratsuka City has built Japan's first road exclusively for cyclists. Since being opened to the public in October last year, the road has proved a big hit among cycling enthusiasts not only in Hiratsuka and vicinity, but in other areas as well. On holidays, members of cycling clubs in Tokyo arrive at the road by cars with their bicycles on the roof to enjoy cycling free of urban congestion.

Stimulated by the marked success of the first cycling road, moves to build similar roads have mounted swiftly in various parts of the country. Already, work on a 13-kilometer cycling road has started in Saitama Prefecture, while in Fukuoka Prefecture, a plan is afoot to build a long 85-kilometer cycling course, and work on part of it is to be started before long.

In the Izu Peninsula, the Japan Cycle Sports Center, the first cycling circuit in the world, is being constructed to be completed by the time the Japan World Exposition, 1970, Osaka (EXPO '70) begins. The center will have two circuits for cycling races—five and three kilometers, respectively—, a children's circuit, "Cytel" (cyclists' hotel) with accommodation for 150 persons, and even 1,000 bicycles for hire. Upon completion, this full-scale cycling center will doubtless become a mecca for cyclists in Japan.

Japan's bicycle industry already measures up to top international standards. Moreover, various exclusive facilities for cyclists are coming into existence one after another. Prospects are, therefore, that cycling will establish itself as a main form of recreation among the Japanese public in the not distant future.





Cycling club members come with their bicycles tied to the roof of a car to enjoy cycling along the Hiratsuka course.







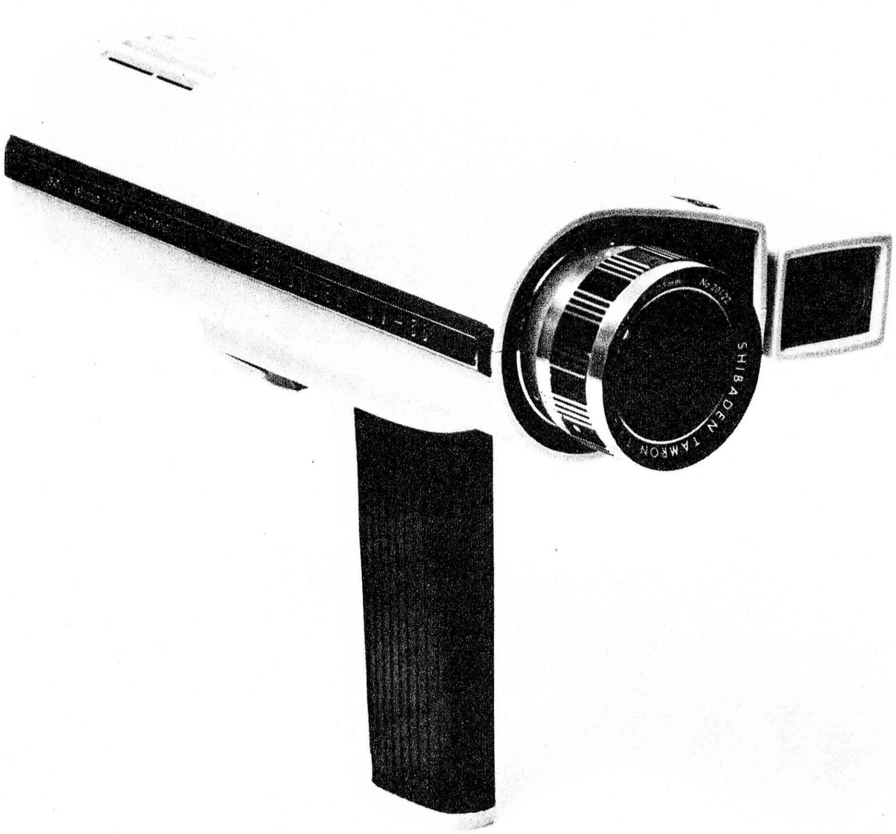


Far above and above: Brief rest before an overpass of New Tokaido Line, as a 200-km/h superexpress streaks by, thrilling cyclists with the sense of speed. Left: Cyclists with camping outfits tied to their bicycles enjoy free cycling along the road in the course of a tour.

INDUSTRIAL DESIGN IN JAPAN

a modern version of tradition

Text by EICHI IZUHARA



This compact TV camera is capable of mass production for sale to general households in view of a possible advance of TV camera into home life as a result of the marketing of videocorders for home use. Maker: Shiba Electric Co. Design: ROC Industrial Design Office.

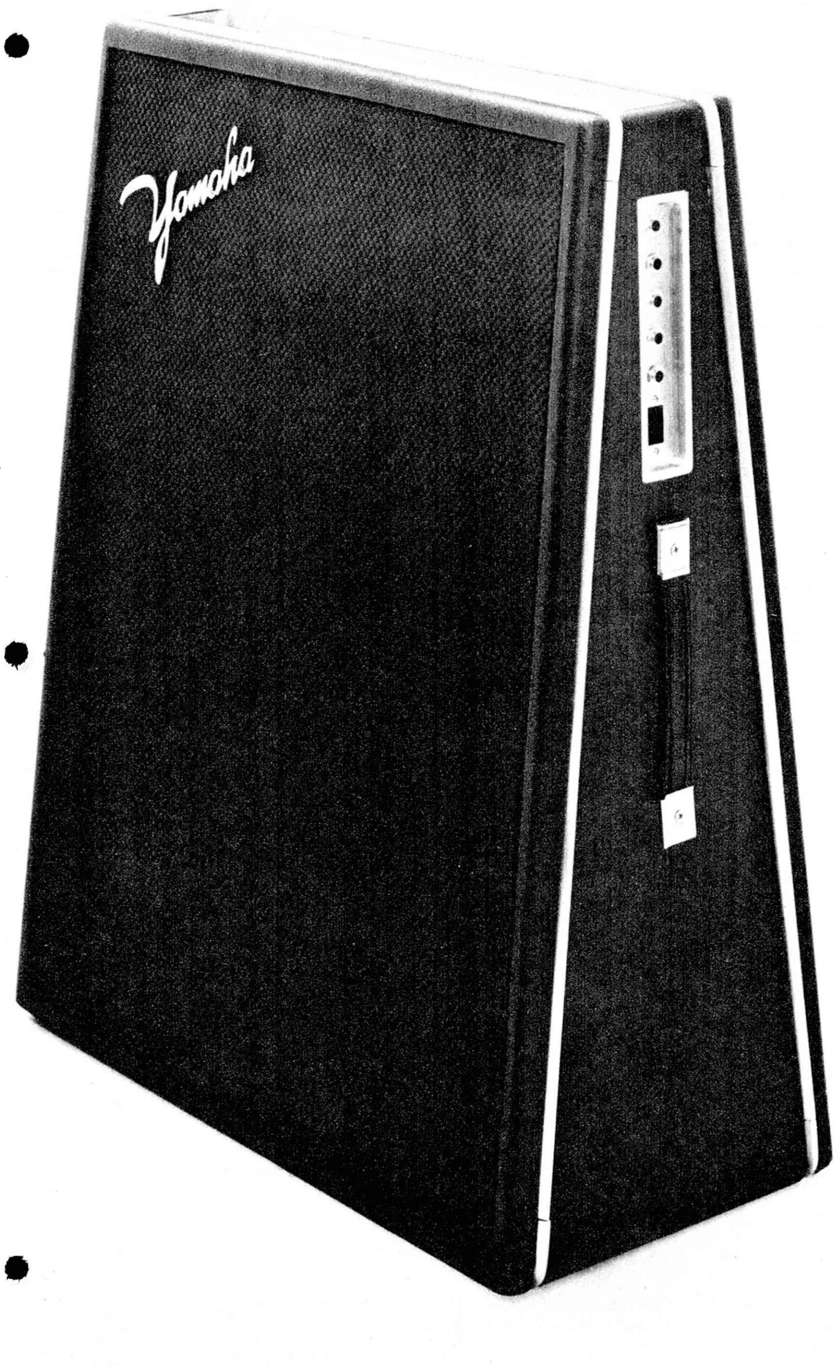


Electric shaver. Operated by A.C. power, it features a keen sense of cleanliness and functional efficiency. Maker: Tokyo Shibaura Electric Co., Ltd. Design: Staff designers.

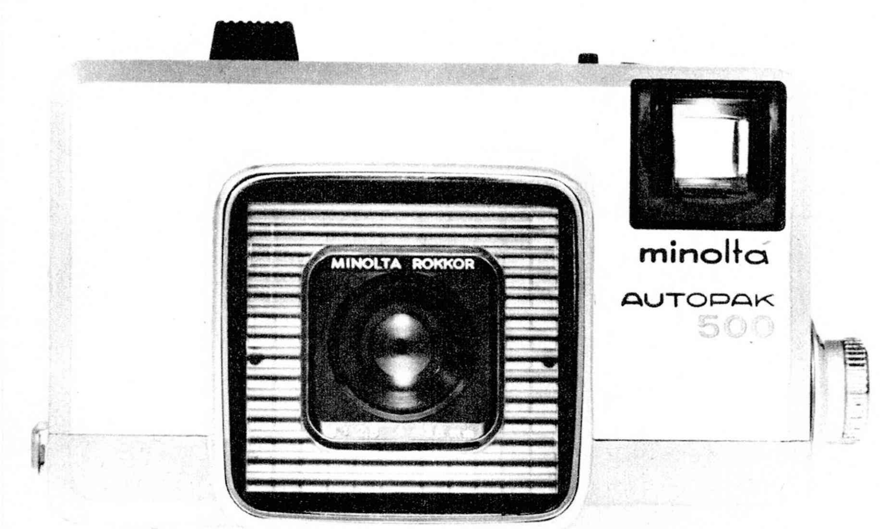
Industrial design in Japan that symbolizes, in a sense, the conflict between values shaped by a long cultural tradition and those produced by a radically expanding Japanese industry has made it possible to unify artistic and scientific knowledge.

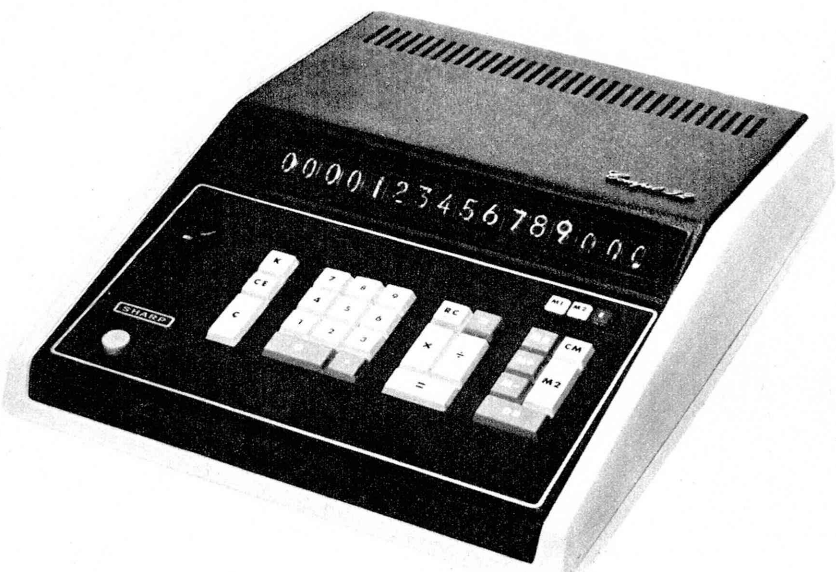
The philosophies of John Ruskin and William Morris had a strong impact on Japanese craftmen towards the end of the 19 century. A modern movement whose objective was the development of the craftman as a creative artist thus coincided with the Japanese Industrial Revolution, which was started late as a result of the long national isolation. It was characteristic of the time that a good many of the products, even those mass-produced, were handmade by many artisans. Under these conditions, even if there were industrial designers, they could have had only a small chance to participate in industry.

Education in what is now called industrial design was already formalized in 1901, when a program was set up at The Tokyo Technical College to teach industrial arts. In 1930, a design school reflecting the educational system of the Bauhaus was established in Tokyo. It was unfortunate that this school ran counter to the nationalistic feeling of the time and did not survive. The wars during the 1930s and 1940s, and the consequent military pressures that bore down on the country, gradually supressed all cultural activities, and the designers of that time had to wait for a more opportune moment to revive their activities.



This 30 W amplifier, for guitar, marked by high portability, incorporates the newly developed flat-type speaker. Maker: Nippon Gakki Co. Design: GK Industrial Design Association.



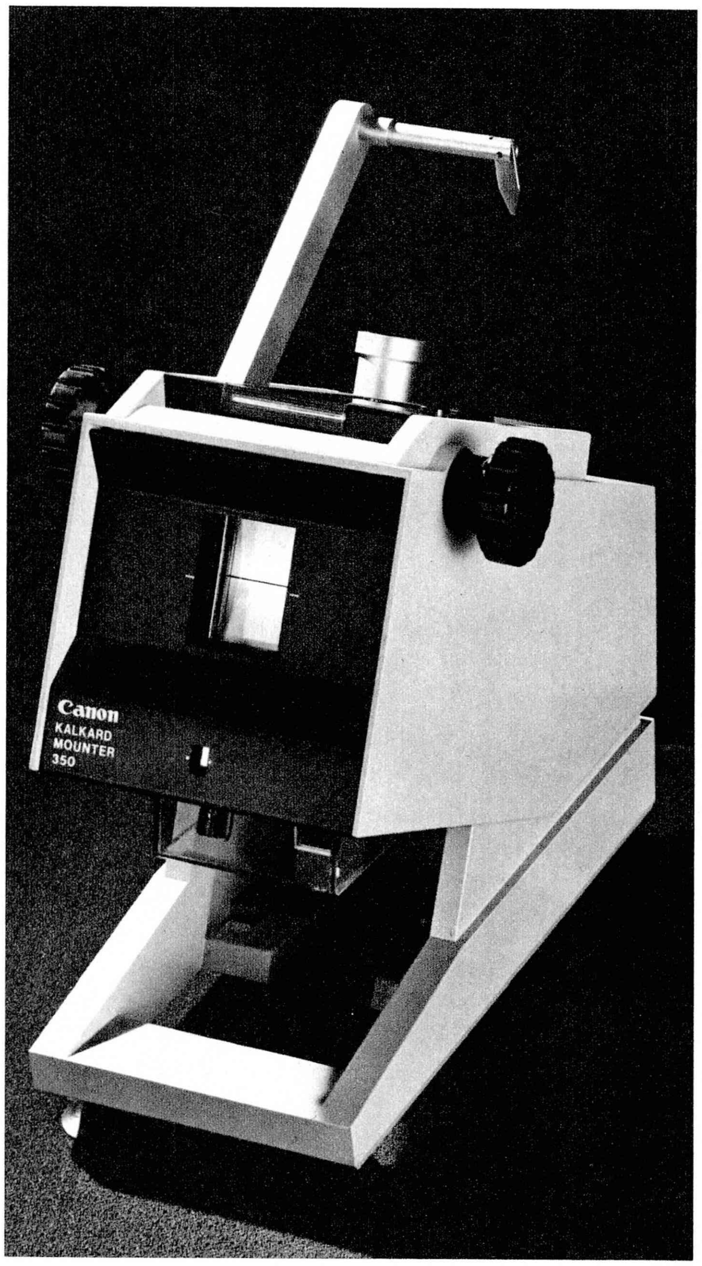


Top: EE camera. A device interlocked with EE (electric eye) enables automatic switchover to automatic diaphragm adjustment and flash gun circuit. Maker: Minolta Camera Co. Design: Staff designers of the company. Above: Desk computer. A full use of IC (integrated circuits) has reduced both size and weight, while enhancing reliability and efficiency. Maker: Hayakawa Electric Co. Design: Staff designers of the company.

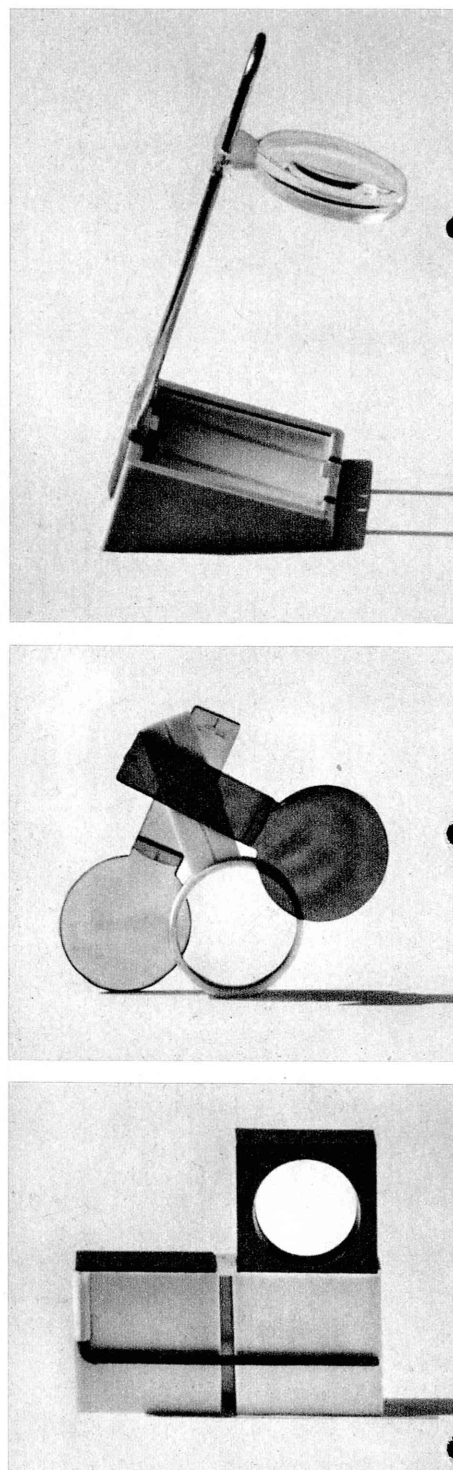
The rapid revival of Japanese industry in the 1950s created at once a competitive market within the country and this stimulated manufacturers to seek the aid of industrial designers. A golden opportunity opened at last for designers whose ideas had been repressed till then. It can thus be fairly said that the designers who led the post-war design movement belonged in spirit to the pre-war era. Having obtained their training before the war, with little support from the industry of the time, they had in general more artistic attitudes than the post-war manufacturers expected of them from their commercialism.

A synthesis, however, was at hand. Multiple actions took place: the foundations of the Japan Industrial Designer's Association, Mainichi Press' Annual Design Competition and Exhibition, the Selection of Good Design Products by the Ministry of International Trade and Industry, etc., soon followed one after the other. In education, many colleges began, by 1951, introducing contemporary courses and curricula in industrial design. It is the graduates from these schools who are now active in the field, and who must be credited with establishing new horizons for industrial design in Japan.

"In spite of the pressures of today's radically changing conditions, the general design trend of the Japanese product still seems to be oriented towards a sense of balance and measure: it offers an expression of dignity and intense simplicity that appeals to long-



Microfilm mounter to make apature cards with 35mm roll type microfilm. Mounting speed; 500 cards per hour. Maker: Canon Camera Co. Design: Staff designers of the company.

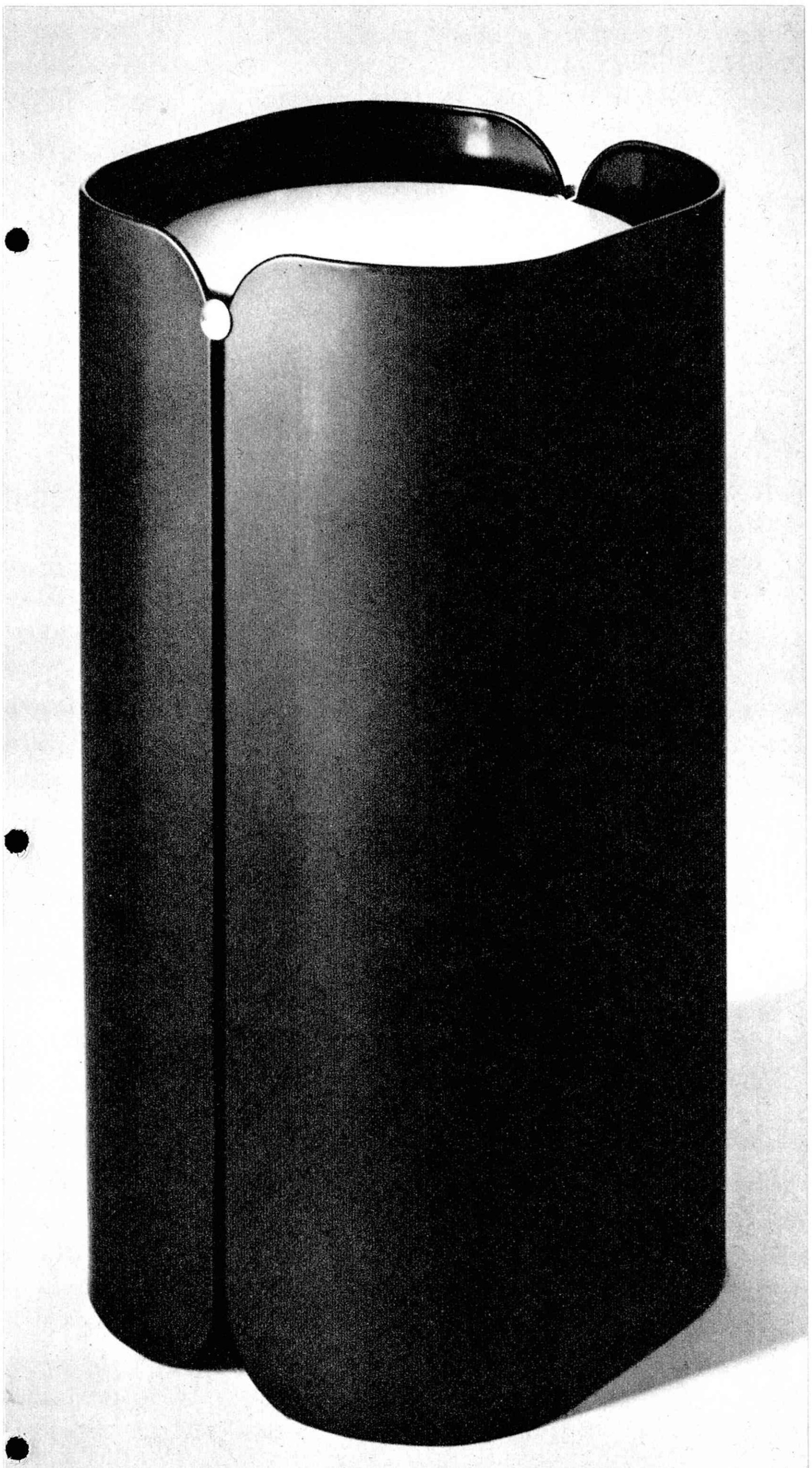


Magnifying glass set, teaching tool of science source. It is instrumental in arousing interest in scientific study of children. Maker: Gakken Co. Design: Yoshio Akioka and his group.

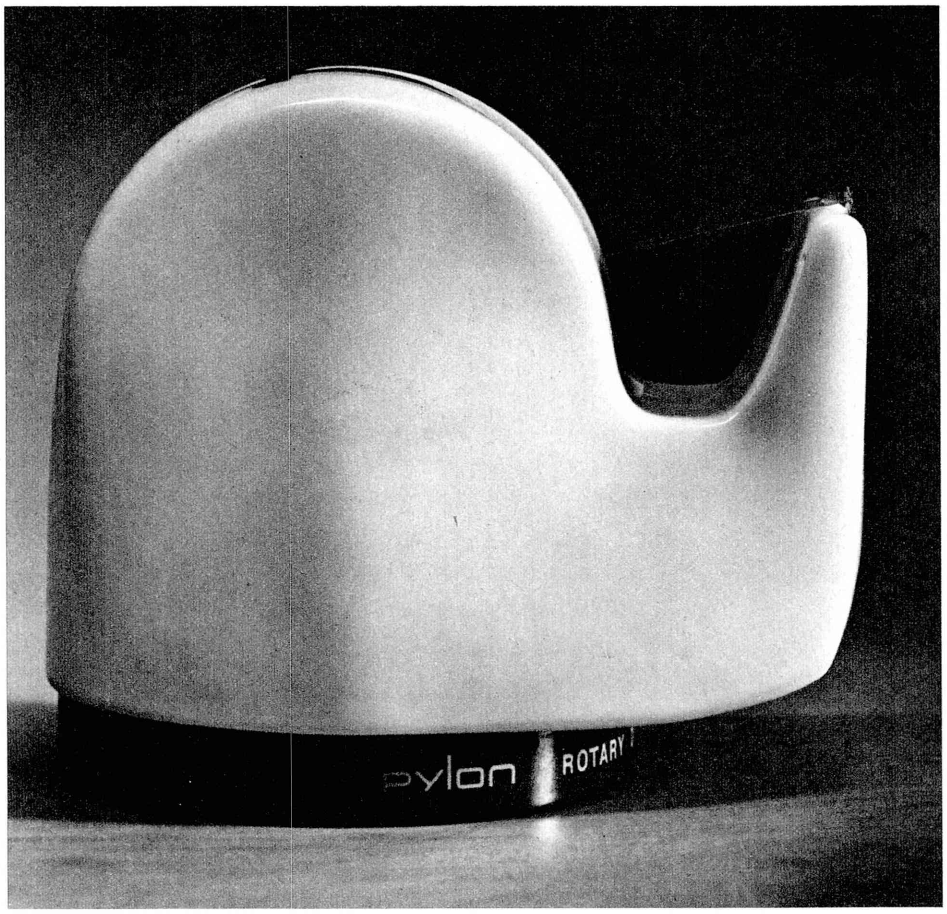
term spiritual values rather than to immediate human acquisitive impulses." . . . . according to Nathan H. Shapira, professor of University of California, U.S.A.—"A sense of continuity and persistent refinement has been the determining factor of a long process which leads to the clarity and simplicity of many modern expressions of Japanese design."

Simplification was, as often said, and still is, an institution of the Japanese. It is said that Japanese mathematicians, who spread out over the world, show splendid ability in simplifying the solution of difficult problems. In general, when a Japanese is confronted with a problem to be solved, he is apt to seek in advance the shortest solution among all the possible ways, perhaps in order to conserve his energy. The attitude may be based on the characteristics of typical Japanese physique—rather small, light and pliable. Thus the same attitude as seen in the shortest poetic form 'Haiku' and in the traditional 'Noh' play can be seen in wellknown Japanese cameras, cosmic rockets and recently developed SMD (Sony Magnetodiode), etc., whose simple mechanisms work as well as other more complex ones.

It is this attitude of simplification without losing the essence and objective that makes it possible for Japanese to absorb so many varieties of cultures through their long history. This is a tradition of Japan and industrial design is one of its modern trends.



Trash box. Designed to harmonize with not only modern buildings, but old-style rooms as well. Trash basket in the box is taken out with a handle attached to the lid. Maker: Aoki Co. Design: Hara Yoshiteru Design Office.



Cellophane tape cutter for desk use. It has an iron-cast base, and tape is attached to the rotary section, made of synthetic resin. Tape can be cut from any direction. Maker: Kyowa Rubber. Design: Yanagi Industrial Design Inst.

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LEISURE

Pet Boom in Japan

A mood of peace still pervades Japan, despite turbulent developments in many parts of the world. And a pet animal fad has been spreading year after year. For instance, imported dogs, which totaled 985 in 1967, have swelled to nearly 3,000 this year.

Some animal dealers in Japan station their representatives in Britain, the home of pet animals. These agents never fail to visit dog shows, and when they find good dogs, they buy as many as 20 or even 30 at a time for sending to Japan by air. In one instance, 65 dogs arrived by one aircraft from London. Most imported pets are "mini dogs" for people living in plush mansions. Many of infant dogs two or three months old, such as Yorkshire terrier, Maltese and other miniature dogs are priced at as much as 200,000 to 300,000 yen.

The Animal Quarantine Station at Tokyo International Airport is embarrassed by a rush of dog imports, since those arriving dogs must be kept at the station for medical check for at least two weeks. Although the station has built and expanded its kennels, dog imports have soared at a quicker pace than anticipated.



"Dog Shows" attract thousands of manias.

A pet bird boom is no less widespread than the dog fad. The number of imported linnets, which stood at about 200,000 last year, already came to 150,000 in the first half of 1968. This year, mynahs imported from Southeast Asia have already aggregated 5,000, while Java sparrows and parrots have totaled 80,000 and 1,000, respectively. Thus Japan is importing popular birds at a pace twice as fast as last year. The sharp increase in pet birds is not limited to imported species alone, and domestic birds, such as lovebirds, parakeets and paddybirds, are in great demand.

FASHION

Uniforms of Japanese Athletes for Mexico Olympics Announced

The uniforms of Japanese athletes for the Olympic Games to be held in Mexico City in October were completed and announced recently.

Both men and women's uniforms consist of three types—that is, for ceremonial, daily and training wear. The color tone, based on red and white symbolizing Japan's "rising sun" flag, is the same as that of uniforms for the Tokyo Olympics. The men's ceremonial uniform comprises a red blazer, white trousers and a white felt hat. The number of buttons on the blazer—three for the Tokyo Olympic uniform—has been cut to two. This impresses one as refreshing. The women's blazer is white as contrasted with the red skirt. This, it is said, has taken a hint from the *hi-no-hakama* (a sort of pleated red skirt), once worn by Japanese women on ceremonial occasions. The women's hat is red and broad-brimmed. On the whole, the women's ceremonial uniform accentuates a feeling of sweetness. The men's uniform for daily wear is made up of a black coat and gray trousers. The women's daily wear is a bright blue one-piece dress of a "semi-mini" look with the hemline three centimeters above the knee. Uniforms for both men and women have the "rising sun" and five-ring Olympic marks on the breast.

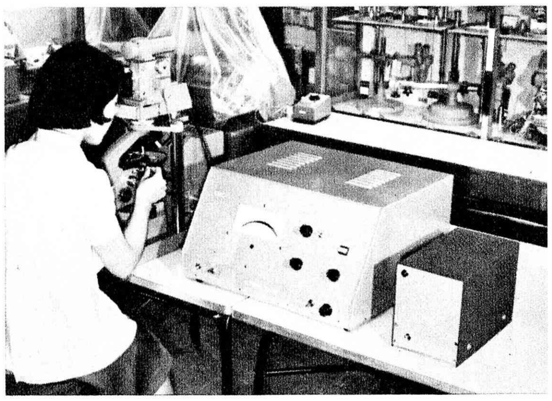


How many medals can Japanese athletes get?

SCIENCE

New Weapon to Detect Cancer

The Cancer Study Group of the Obstetrics and Gynecology Section of Chiba University's Medical Department has recently completed a new device for a quick and accurate identification of cancer cells, which so far has relied on the subjective judgment of the doctor for final diagnosis. The device is a product of intensive research conducted by the group (led by Prof. Yuzo Misonou) for two years with the cooperation of the Olympus Optical Co. It is designed to detect uterus cancer, but is believed to be applicable to other forms.



The new device is easy to operate.

The new device throws special light upon cells taken out of the human body, and the extent and scope of the light absorbed by the cells is mechanically measured to show by figures whether they are affected by cancer or not. And the size of a cancerous cell and the degree of its malignancy are also automatically indicated. Since the equipment is easy to operate, it is said, any examiner can make a diagnosis after a certain period of training.

Clinical data on the new measuring device shows that out of a total of 65 suspected cases of uterus cancer, the equipment failed to detect cancer in only three instances. The ratio of accurate identification thus turned out to be 95 per cent.

Dr. Misonou said: "The device, I think, is epochal in that the total amount of nucleic acid in a cancerous cell, so far judged through complicated calculation, is automatically measured and instantly shown by the reading. If and when the difficult judgment, now entrusted to a limited number of specialized

doctors, is taken over by the new machine, it will become possible to diagnose numerous people with dispatch."

Meanwhile, Olympus Optical Co., which has manufactured the device in cooperation with Prof. Misonou's group, says that the mass production of the equipment will commence next year, if possible, for sale to university hospitals and other institutions concerned throughout the country.

Japan Succeeds in Producing Plutonium 239

The Japan Atomic Energy Research Institute recently announced that its reprocessing development laboratory had successfully produced about 18 grams of 95 per cent-pure plutonium 239. This means the birth in Japan as well of a new element that does not exist in the world of nature, is more expensive than gold and can be a powerful nuclear fuel.

Plutonium 239 is produced in fuel bars when they are used to operate an atomic reactor. It is a valuable fuel for a wide range of peaceful uses of atomic energy, including atomic power generation. Especially, it is considered the most appropriate fuel for the fast breeder reactor (a device that, while generating atomic energy, creates additional fuel by producing more fissionable material than it consumes), which is believed to be a prime power source of the future. Therefore, intensive studies are being rushed by many nations for the development of "reprocessing" equipment to extract and refine plutonium 239 out of used nuclear fuel (the so-called "ashes of atomic reactor"). Previous to Japan, only three non-nuclear-weapon states—India, Belgium and Norway—succeeded in the production of plutonium. The Japanese research quarters concerned, therefore, are all the more jubilant.

Nevertheless, the news of the successful manufacture of plutonium 239 does not necessarily appear to be a source of simple rejoicing for certain scientists and intellectuals. These people, who tend to be reticent about the matter, are supposed to be largely influenced by their still green recollection that an atomic bomb which wrecked Nagasaki 23 years ago on August 9—the second bomb of its kind ever to be dropped on man following the one that leveled Hiroshima—comprised about eight kilograms of over 95 per cent-pure plutonium 239. The Atomic Energy Research Institute said the next experiment could produce more than 100 grams of the element. Furthermore, a reprocessing plant with a monthly production capacity of 6 kilograms will be built two years hence.

The Fundamental Law on Atomic Energy, enacted in 1955 at the initiative of scientists, says in Article 2 that the "research, development and utilization of atomic energy shall be limited to peaceful purposes." Yet since there is no penal provision for any violation of the clause, some scientists wonder how far the law could be effective. Some even compare plutonium 239 to a "man who, though violent and wayward, cannot be treated coldly, since he comes of noble stock." It is earnestly hoped that plutonium 239 will be "fostered smoothly, while preventing it from getting out of hand."

GRAPHIC ART

Japanese Picture Book Wins Top Prize

A picture book by a Japanese woman painter won the top prize at this year's World Festival of Juvenile Books, sponsored by the Chicago Tribune for the last 30 years. The book, titled "The Brave Little Goat of Monsieur Séguin," is an adaptation for children from A. Daudet's novel, a cooperative work of two women—the story by Eriko Kishida and the pictures by Chiyoko Nakatani.

At the world festival, picture books were, of course, judged mainly on the basis of illustrations. Nakatani, who drew the pictures of the prizewinning book, studied oil painting at the Tokyo University of Arts, and it is already 12 years since she started painting for picture books. Convinced that "a picture book is a form of art," she does a very scrupulous job, for she believes that pictures for children must fully satisfy the requirements of formative art. Every character and animal in her picture books—children, bears, hippos, porcupines, goats, etc.—exude a bright atmosphere. And this is the very expression of her own character. Kishida, who teamed up with Nakatani in making the prize-winning picture book, is a poetess and a classmate of Nakatani's in her university days.

Several picture books, produced by this team, are also published in foreign countries, such as the United States, France, Britain, Germany, Switzerland and Denmark. Meanwhile, their works have also won prizes in



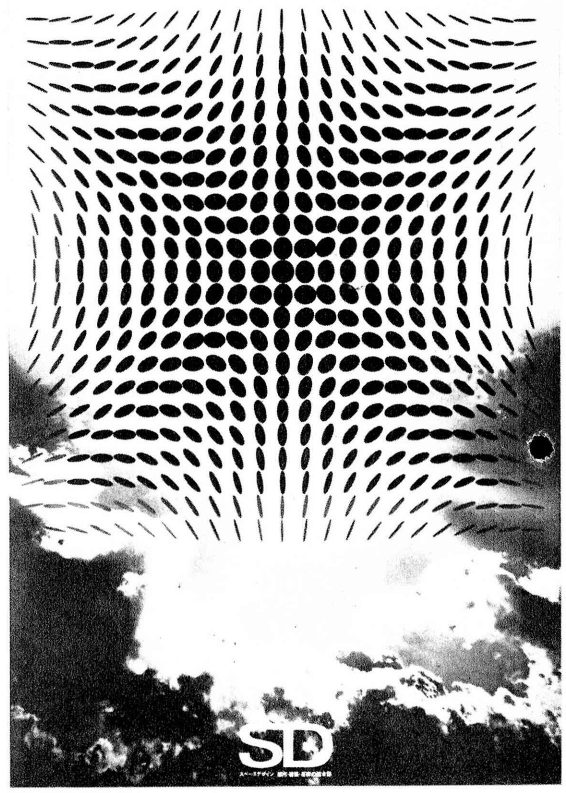
"The white goat was so happy that . . . ." Illustration by Mrs. Chiyoko Nakatani.

Japan. After receiving the top prize at the American contest, Nakatani said: "However far the audio-visual culture as represented by television may advnace in the future, picture books consisting of delightful stories and pleasant pictures will remain indispensable for children. I am more than happy that at least this point has been brought home to many people on the occasion of our receiving the prize."

Japan's Graphic Design Wins High Acclaim

Yusaku Kamekura, Japan's noted graphic designer, won the top honor in the PR division of the second International Poster Biennale, held recently in Warsaw, Poland. His winning entry was a poster of EXPO '70 (Japan World Exposition, Osaka, 1970) for overseas use. The second prize in the same division also went to the work of another Japanese, Kazumasa Nagai—a poster for the SD (Space Design) magazine. In the culture division of the same biennial exhibition, a poster of Bunraku (Japan's traditional puppet play), entered by Japan's Ikko Tanaka, also won the second prize. In addition, special prizes were accorded to a poster of the Manza Skiing Ground by Kamekura and a poster of Tokyo's tourism by Tadashi Masuda, also a Japanese. In other words, Japanese entries won more than half of the prizes accorded by the exposition.

The International Poster Biennale was first held in 1966 under the sponsorship of Poland. On that occasion, Japan's Hiroshi Tanaka won the top honor in the culture division, while the top prize in the commercial division also went to Japan's Nagai. Besides, Kamekura's entry received a special prize. That is, Nagai and Kamekura won prizes for the second time at the recent Warsaw exhibition. Furthermore, Japanese entries have gained prizes one after another at international graphic design contests held in such nations as Czechoslovakia and East Germany. Japanese quarters concerned are delighted with the growing recognition abroad of Japanese graphic designers as well as Japan's color photography and printing techniques.



Mr. Nagai's work for SD magazine.

PERSONALITY

Japanese Named Rotary International President for the First Time

The headquarters of Rotary International at Evanston, Illinois, in the United States, recently announced that Mr. Kiyoshi Togasaki, a Japanese, had assumed the presidency of the international organizaiton. This marks the first time that a Japanese has ever been chosen president of Rotary International.

Rotary International is a body dedicated to promoting social welfare and friendship with



Mr. Kiyoshi Togasaki leads the 13,200 Rotary Clubs throughout the world.

an international membership of 640,000 forming 13,200 Rotary Clubs throughout the world. In Japan, there are 850 Rotary Clubs with a membership of 40,000.

Mr. Togasaki, 73, formerly served as president of The Japan Times and did much to establish the International Christian University in Japan. He also has long been active as member of Rotary International. In 1964, he was named director of the organization, and later assumed the post of 2nd Vice President. After assuming the presidency, he was swamped with business correspondence from the headquarters of Rotary International. For two or three days, he sent replies by cable. This roundabout process was so inconvenient, however, that he finally left for the U.S.

Mr. Togasaki emphasizes that Japan should extend a helping hand towards promoting friendship in Asia. A native of San Francisco, he graduated from the University of California. Mrs. Togasaki died of an illness last year, and his two sons and daughter live in the U.S.

TECHNOLOGY

Advent of "Artificial Food" Era

The news that "meat" made from soybean has begun to appear on our table has come as somewhat of a surprise. But when we hear that meat will likely be produced from petroleum as well, we think the news of "soybean meat" is very likely since it must be more difficult to make meat from petroleum than from soybeans.

Thus far, five Japanese firms—makers of foods and confectionery—have put "man-made meat" on the market, produced from soybean or wheat. Protein is extracted from the material, made semi-liquid and then spouted from a nozzle to take a fibrous form. Then a certain amount of the fibrous protein is pressed into "meat." Artificial meat itself is colorless, odorless protein, Therefore, a proper choice of additives can make it taste like beef, pork, chicken or fish. At present, artificial meat is used only as mixture for other "natural" meat to make ham and sausage.

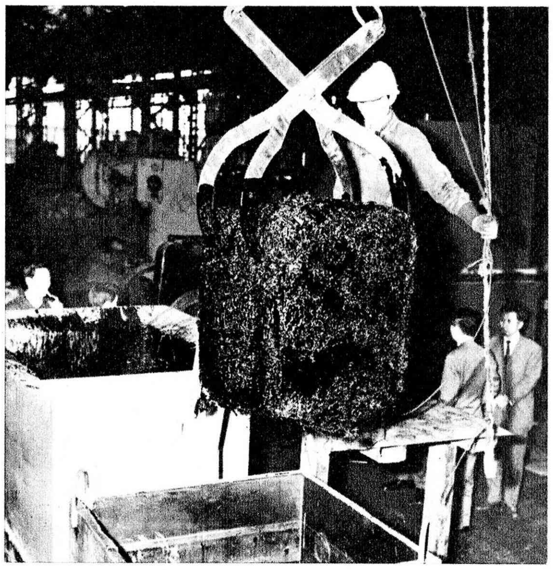
An artificial food that is likely to come into use next to man-made meat is milk made from soybean. Already, ice cream has appeared made of "artificial soybean milk."

If one criticizes these man-made foods as nothing but the replacement of animal protein with vegetable protein, then we can cite a "real" artificial food containing natural animal protein—that is, animal feed made from petroleum. Certain bacteria, feeding on paraffin contained in petroleum, grow and repeat nuclear division, providing large amounts of protein. Protein thus extracted from petroleum is already mixed into compound feeds for hogs and chickens.

And once an artificial food becomes usable as animal feed, then it is only a matter of time before it becomes fit as human food. The use of petroleum to make up for the growing shortage of meat, milk, butter and other foods is indeed a brilliant example of man's wisdom. Yet must we predict that three or five years hence our tables will be covered only with artificial, insipid foods?

Garbage Disposal without Environmental Pollution

How to dispose of mountains of garbage collected every day is a perennial headache not only for Tokyo but all big cities. In recent years, moreover, urban garbage has come to contain a wide variety of substances, even unwanted bicycles, washing machines and refrigerators. Of course, there is no incinerating such items. Furthermore, vinyl refuse has shown a steep increase and if vinyl items are incinerated, not only is the incinerator



The pressed refuse is called "iron fossil."

damaged, but also poisonous gas is generated.

Now, a new garbage disposal machine has made its debut as a possible answer to this headache. The machine, developed by the Tezuka Kosan Co. of Tokyo, presses refuse into tight blocks and covers them with iron sheet, asphalt or concrete. The machine equipped with a powerful press emits neither smoke nor poisonous gas in the process of processing. Moreover, the maker says, the pressed garbage does not decay as it is completely cut off from air. The machine has an added advantage, for the pressed refuse blocks can be used for public works projects, such as land reclamation, creation of housing and industrial sites, and shore protection.

The new machine has come as a great relief for many cities harassed by mounting heaps of garbage. A certain city has already installed the equipment at a cost of 230 million yen. Meanwhile, a private company has been formed to take over the tightly pressed refuse blocks for resale. Tezuka Kosan Co., the manufacturer, is swamped with inquiries from big cities in other countries as well, such as Chicago, New York, Mexico City, Toronto, Manila and Sydney, it is said. It is also visited frequently by representatives from abroad.

WOMEN

Coeds Facing Job Shortage

There has been a sharp rise in the number of girls entering universities and colleges. Of late, however, female graduates have been confronted with the growing difficulty of finding employment and coeds, though young (22 on the average) and well educated, look rather gloomy. Japanese universities send out graduates in March. But examinations for employment, held by various firms, reach a peak from June to July in the preceding year. At present, a swarm of prospective graduates is always seen in front of employment notice-boards at each university. For although several thousand job offers are received by each university, only very few say "females also accepted." Coeds are confident they are in no way inferior to male students in ability. But they are quite powerless if denied an opportunity of taking exams for employment.

Not long ago, female university graduates advanced into banking, department store, aviation and other businesses, forming a new "elite." But now, they have been virtually ousted from these fields by graduates of junior colleges and senior high schools. Officially, employers give no clear-cut reasons, simply saying, for instance: "We have no appropriate positions," or "We shall hire female graduates if and when we have vacancies." In short, however, their reasons may be summarized as follows:

Even if they hire female university graduates by offering high pay, many of these women soon get married and resign. So their average period of employment falls short of even two years. Therefore, they cannot be trusted to learn and do important jobs. As for jobs of secondary importance, female graduates of senior high schools will do. And if really capable girls from senior high schools are trained for jobs, they can be expected to work longer than university graduates, since they are younger.

Apart from whether this signifies employers' "awakening" or "temporary reaction," the situation appears harsh for female university graduates in spite of a general shortage of labor in this country.

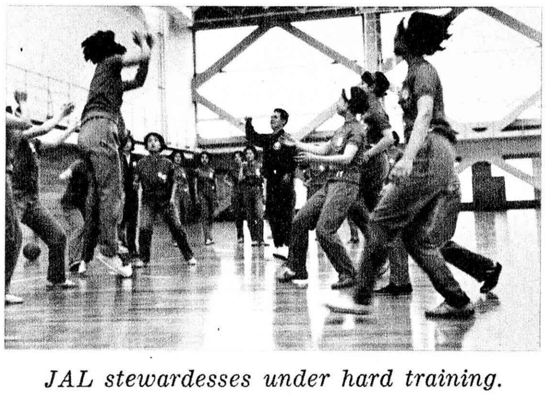
JAL Stewardesses Building Up Stamina for Jumbo Jet Age

The Japan Air Lines (JAL) has set up a physical education course for the training of stewardesses since this spring in a move to build up their physical strength parallel to the courses in language, etiquette and makeup. JAL explains stamina is indispensable for service to passengers with the advent of the jumbo jet age.

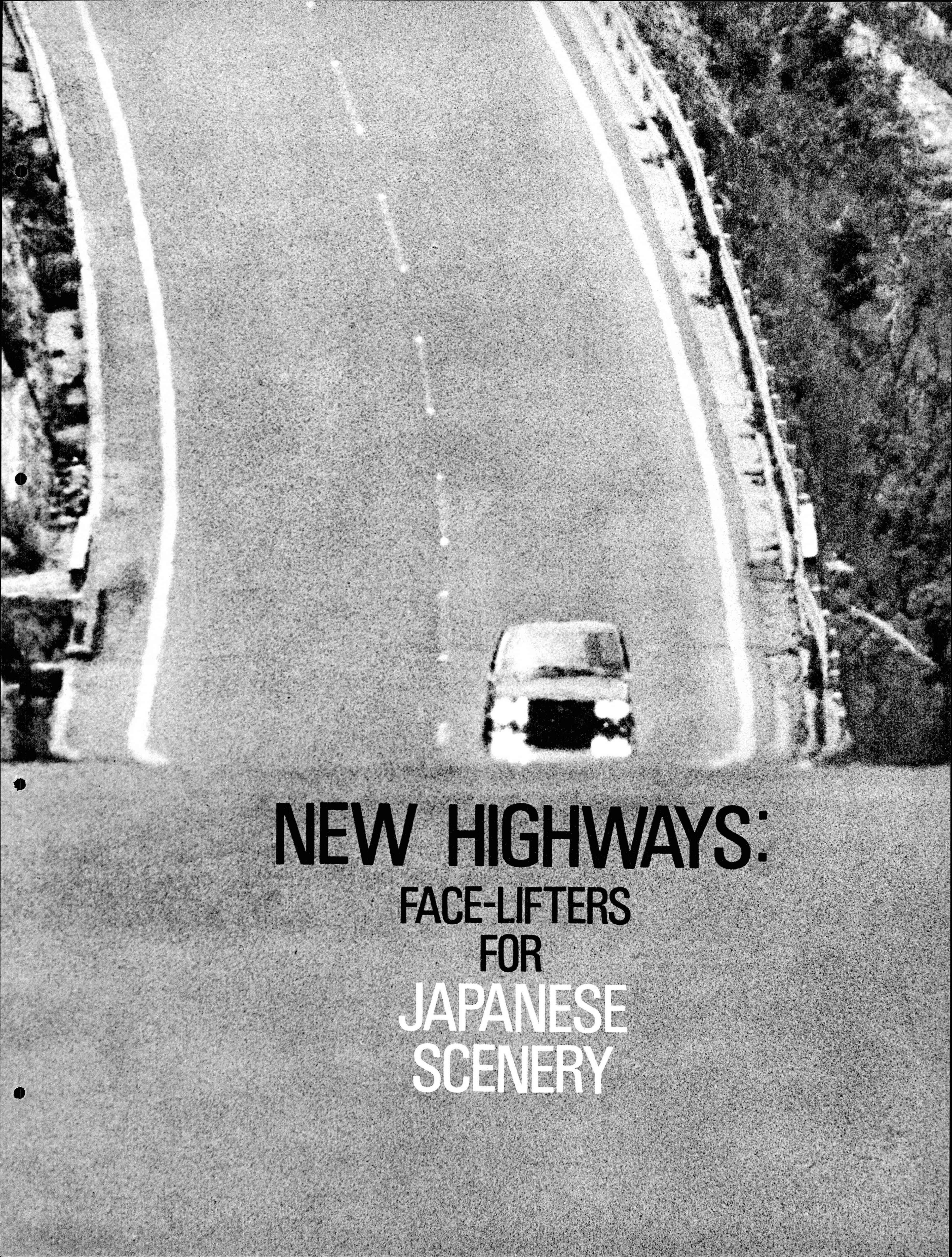
The airline's Cabin Crew Department has started physical tests of stewardesses since last year and these have revealed that these with high athletic ability also excel in service aboard planes. The department has also analyzed complaints gathered from passengers. Some passengers, for instance, said: "I know full well that stewardesses, when at work, are serious and earnest. But they strike me as rather too tense, and have no relaxing mood." As a result of the tests and analysis of data, JAL has arrived at the conclusion that stewardesses are lacking in endurance and physical strength.

Thus the physical education course was set up for stewardesses enrolled last April. At the same time, JAL built a new gymnasium in the compound of Tokyo International Airport. For a total of 75 minutes per week, the new stewardesses, wearing the same uniforms, undergo a physical training. The course, supervized by tough instructors, includes gymnastics, volleyball, basketball and running. JAL plans to have its stewardesses, already in front-line service, also take part in the physical training course.

DC–8 Super 61 and 62 jetliners, placed in JAL's service since June, are three to 10 meters longer than the DC–8's used up till now. Besides, the passenger seating capacity has increased from 150 to 200. Furthermore, Boeing 747 jumbo jets, expected to be commissioned in the spring of 1970, will measure more than 70 meters in length and accommodate as many as 360 passengers. To be sure, if JAL is to survive intensified international competition by providing elaborate services aboard such giant jetliners, its stewardesses apparently will need adequate "physical strength" in addition to being "pretty and kind."



JAL stewardesses under hard training.



NEW HIGHWAYS:
FACE-LIFTERS FOR JAPANESE SCENERY

Japan was once notorious for its bad roads and branded as the most backward in road improvement among the advanced industrial nations of the world. But now that this country has become the No. 2 producer of automobiles in the world, it is steadfastly living down such a bad reputation. Amid a storm of "motorization" sweeping the country, Japan's highway network is expanding rapidly day by day through mountains and across rivers and straits. The new highways are giving birth to a fresh beauty and atmosphere for Japan, which has entered a "century of roads."

MEISHIN EXPRESSWAY

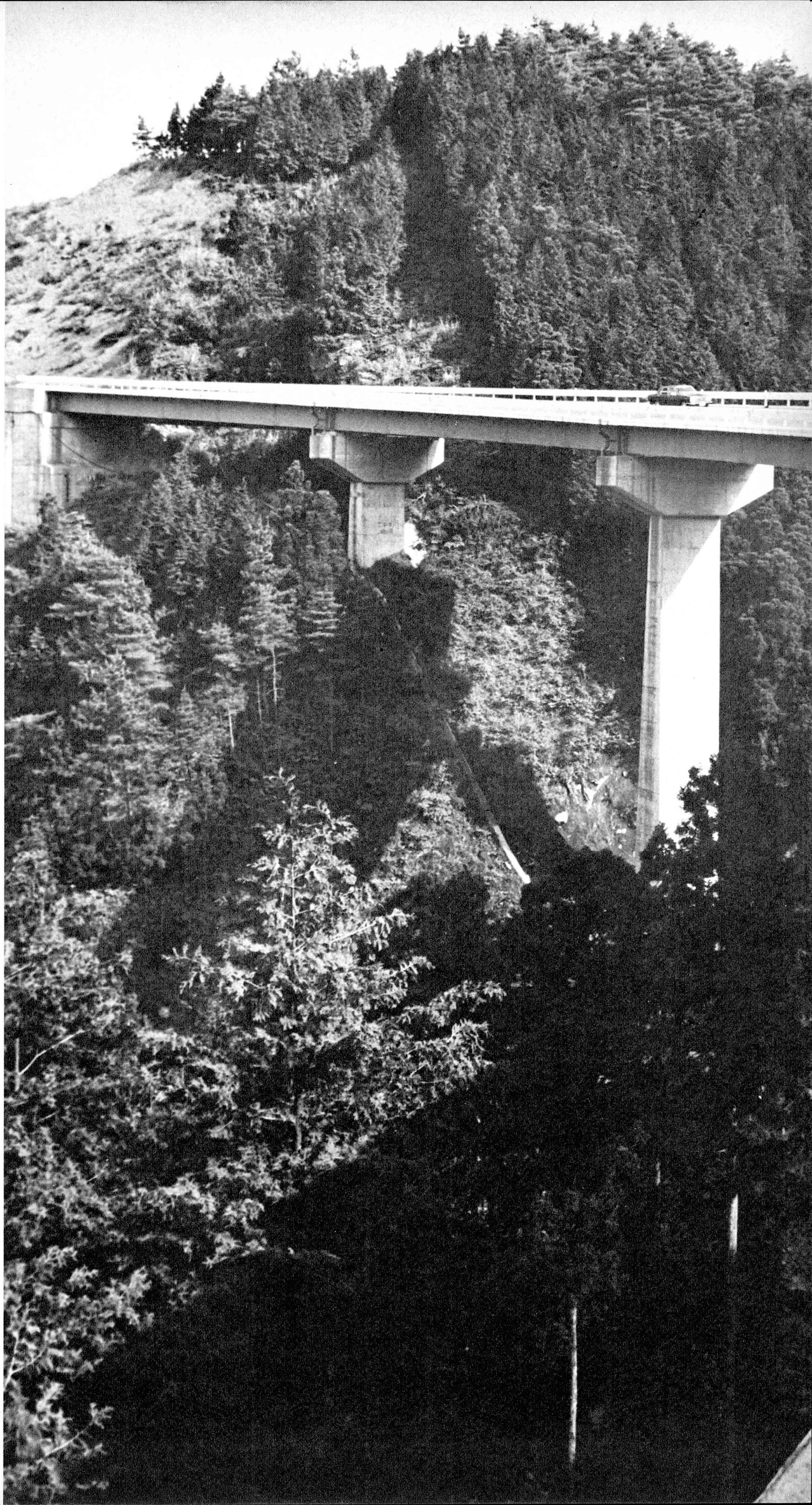
The Meishin (Nagoya-Kobe) Expressway was formally opened to the public in June 1965 as Japan's first full-scale speedway. The 190-kilometer highway with 14 interchanges directly links the Hanshin (Osaka-Kobe) Region, the third largest. It has therefore brought immense benefits to economic activities. The construction cost is placed at 120,000 million yen, averaging 600 million yen per kilometer. This expressway connects at the Komaki Interchange in the suburbs of Nagoya with the Tomei (Tokyo-Nagoya) Expressway, which was partially opened in May this year and, when completed, will link Nagoya with the Tokyo Region, Japan's largest economic sphere.

The Pacific Belt areas with Tokyo-Chiba at the eastern end and Osaka-Kobe at the western end, and with Nagoya in between are generally called the "Tokaido Megalopolis." This district, though occupying only 20 per cent of Japan's total area, accounts for as much as 60 per cent of the nation's consumer purchasing power, 70 per cent of the total industrial production, and retail and wholesale business, 80 per cent of bank loans. It is thus literally the heart of Japan. And the Meishin and Tomei Expressways form a prime artery of the "automobile era" running through the Tokaido Megalopolis.

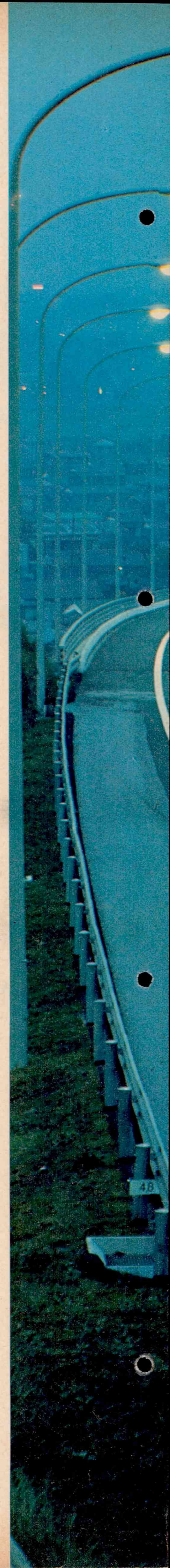


Right: Meishin Expressway. Opposite page: Hakone Turn Pike. It is noteworthy that highways themselves, though cutting modern figures, blend harmoniously into the nature.








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TOMEI EXPRESSWAY

This 350-kilometer expressway along the Pacific coast connects the Tokyo and Nagoya districts. Its designed speed for automobiles is 120 kilometers per hour, and there will be 21 interchanges. It was partially opened to traffic in May this year and is scheduled for completion by May 1969.

True to its nickname "Japan's Golden Route," the Tomei Expressway is the most beautiful and most excellently designed highway. When you travel by this highway, your car will leave the congested Tokyo and run for a while beside the Tama River. Soon a magnificent toll gate with as many as 24 booths



Chofu interchange, Chuo Expressway.

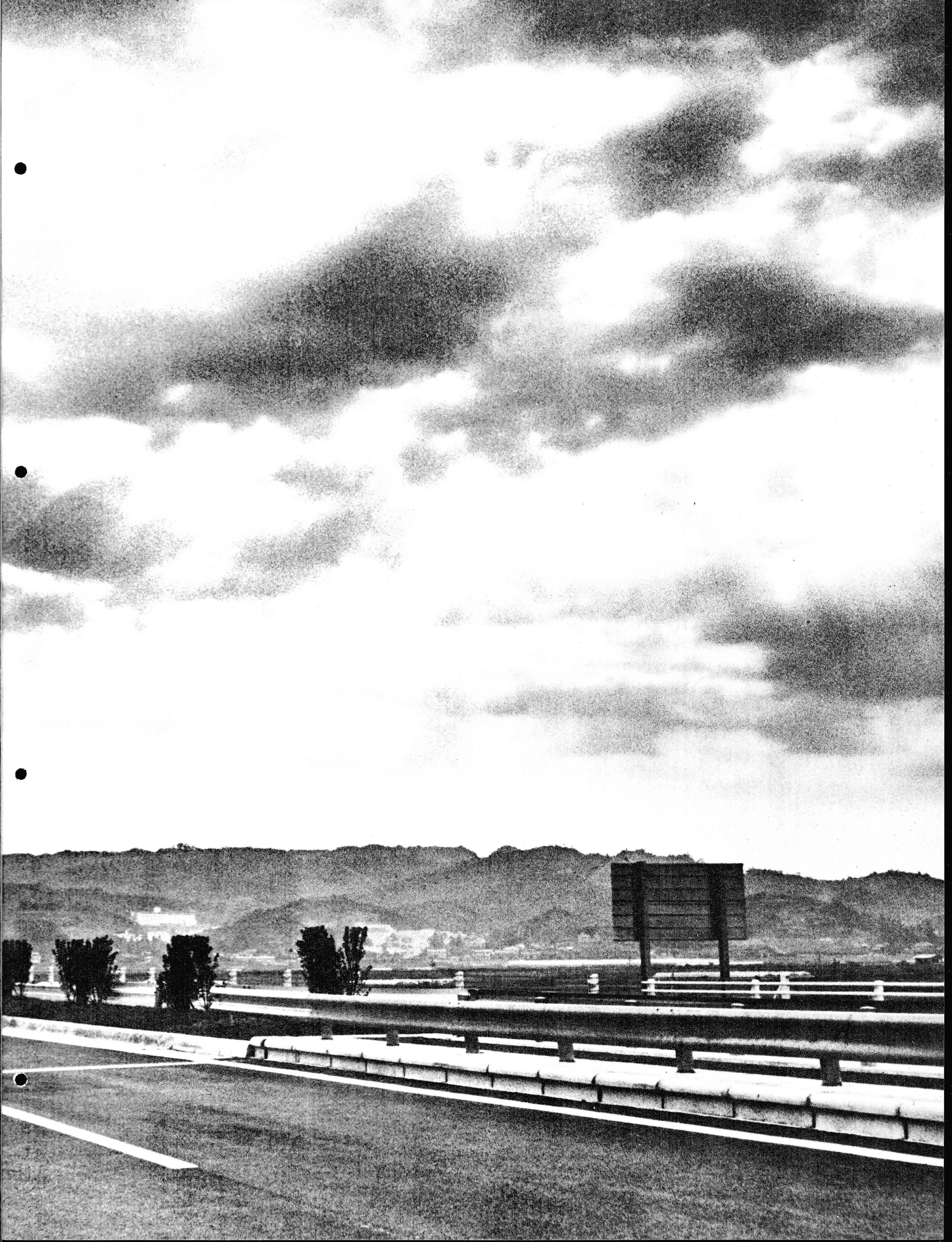
—said to be one of the largest in the world—will appear in front of you. From here on extends a 350-kilometer expressway with the richest variety of scenery among the speedways of the world, enabling you to enjoy an exquisite blending of both natural and artificial vistas. It may well be called a "work of art," into which all of the cream of the world's road engineering and valuable experiences in the Meishin Expressway project are being poured in a thoroughgoing pursuit of beauty of the roadway, safe driving and stability of structure.

CLOTHOID CURVE

One of the main characteristics of the Tomei Expressway and Chuo Expressway (90-kilometer highway linking Tokyo with Mother Nature at the foot of Mt. Fuji) is that almost all con-

(Color Pages) Left: Meishin Expressway, near Hikone. Right: Tomei Expressway at dusk, near Kawasaki. (Right) Tomei Expressway, near Nagoya City.



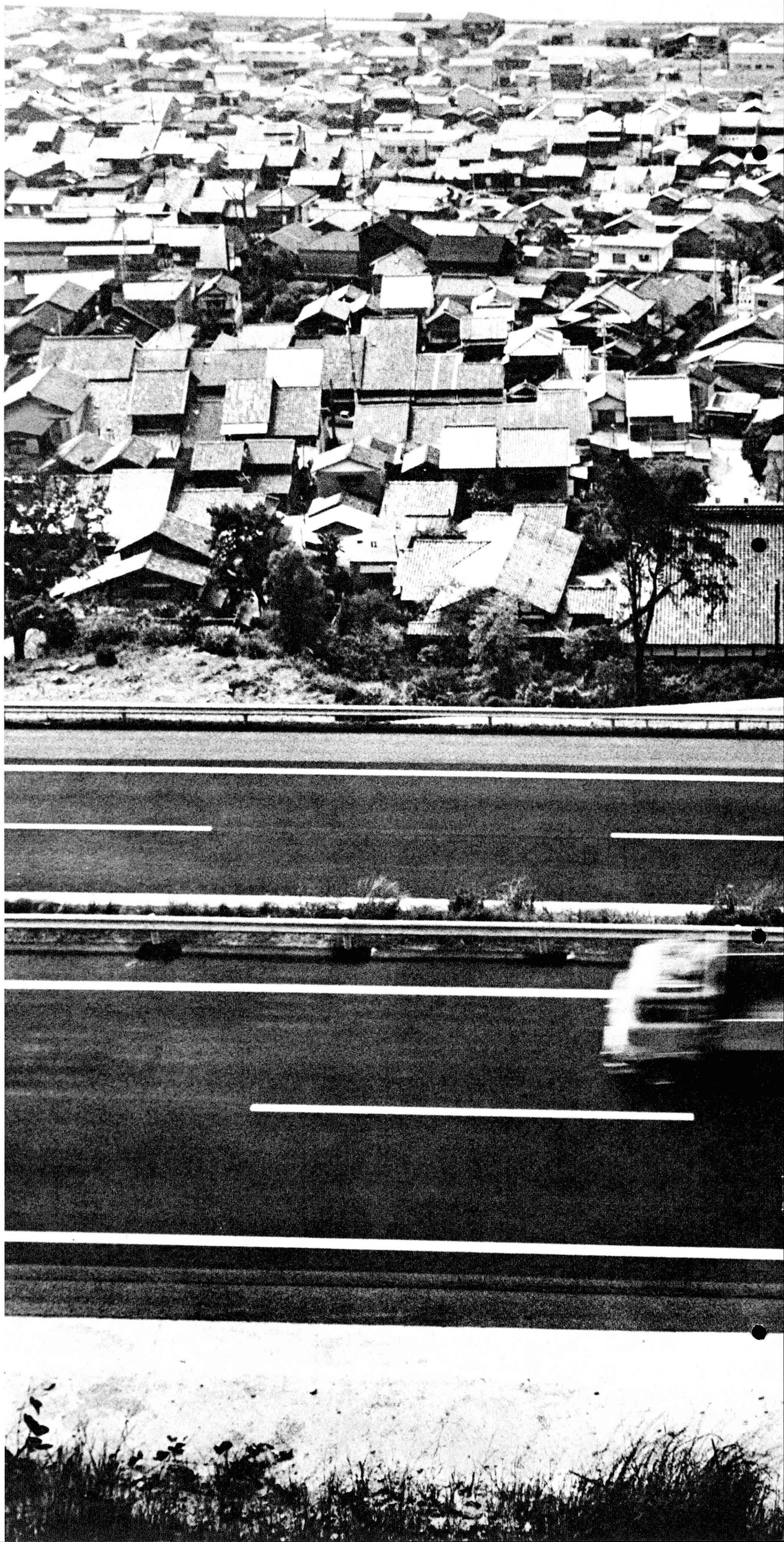


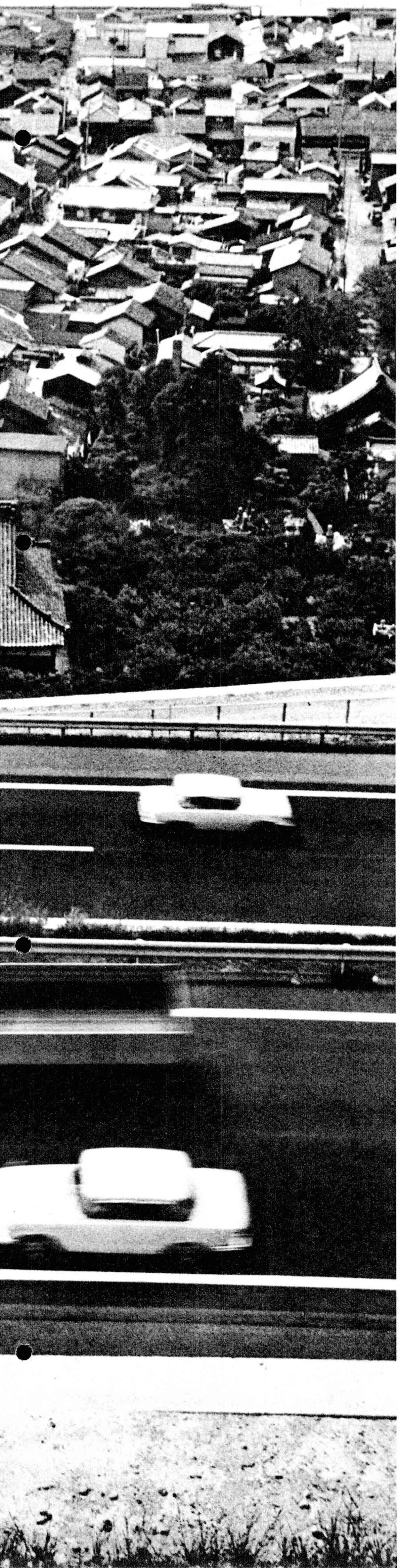
sists of the Clothoid curve. This is also true of bridges, elevated sections and tunnels. The purpose is to ensure road beauty and safe driving. As a car gradually follows the curve, different scenery is seen by the driver, who is looking straight ahead. As the curve becomes sharp or gentle, the tempo of change in scenery gets faster or slower. The driver need not look aside to see the dignified beauty of Mt. Fuji and the deep blue Pacific Ocean, for instance. Completely enthralled, he or she will have no time to doze at the wheel.

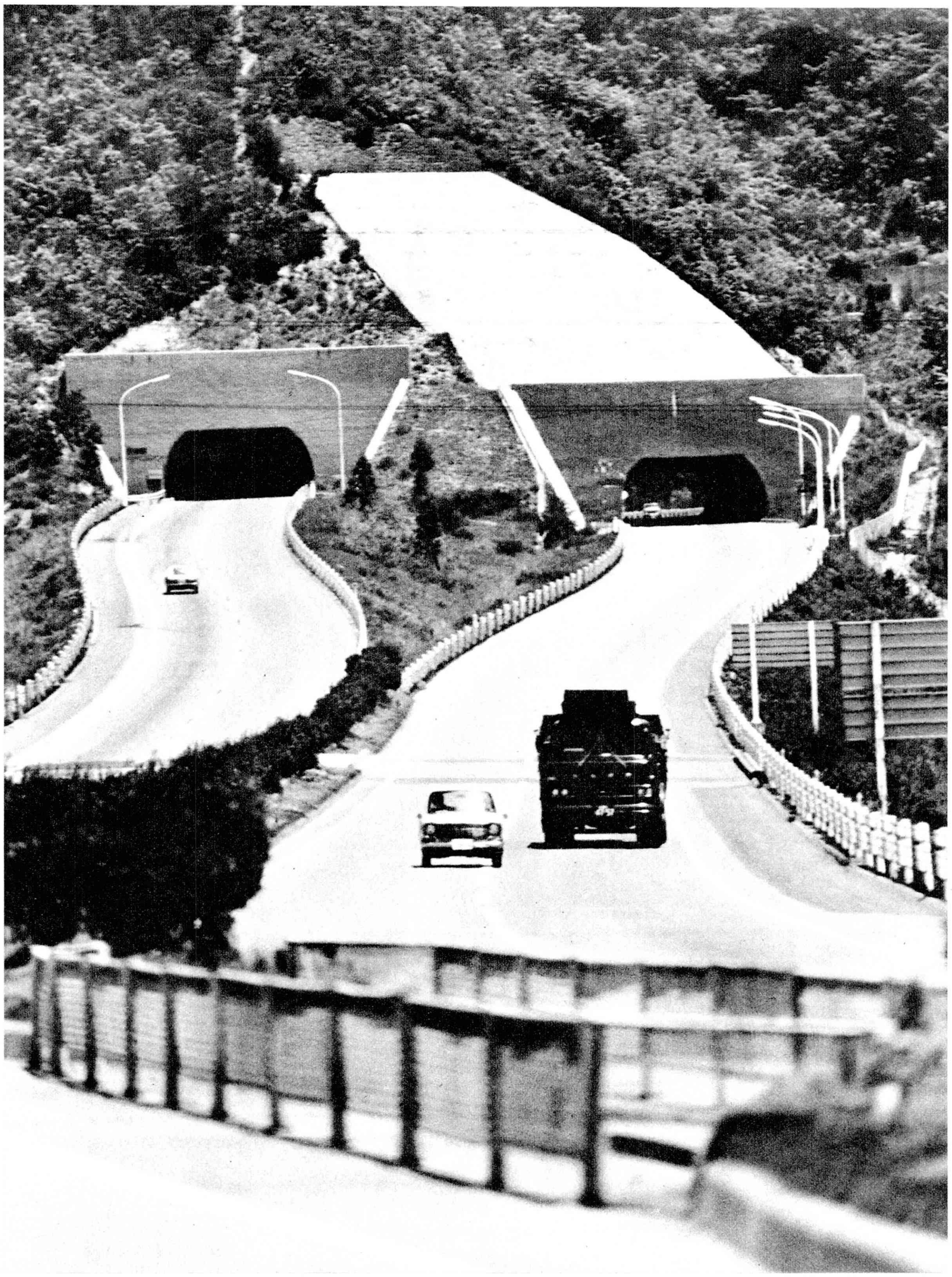
The Tomei Expressway is said to be probably the most expensive road in the world. The total cost is given as 342,500 million or an average of approximately 1,000 million yen per kilometer. The high cost may be better understood when compared with the average cost of less than 300 million yen per kilometer for American highways. One of the reasons for such high cost is the complexity of geographical features, which has made it necessary to use every road engineering technique, including tunnels, bridges and elevated highways. For instance, there are 11 bridges more than 300 meters long, led by the 1,071-meter Tenryu River Bridge, and as many as six tunnels with a length of 500 meters or more, the longest being the Nihonsaka No. 1 Tunnel (2,025 meters) between Shizuoka and Yaizu. Another reason for the high cost is the tremendous expense of purchasing land, since land in the Tokaido Megalopolis, a well developed region, is accompanied with various rights and interests. Nevertheless, the Japan Highway Public Corporation, the builder of the road, is confident of paying off both the principal and interest of the cost in a little more than 20 years. And this confidence naturally stems from the vast economic benefits expected of the Tomei Expressway.

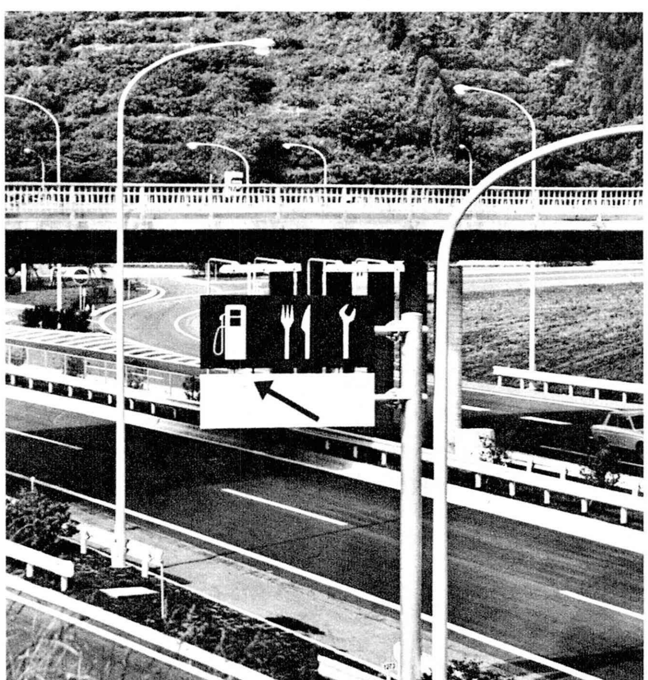
ERA OF HIGHWAY

Upon completion of the Tomei Expressway and the Chuo Expressway in next year, the total length of Japan's modern speedways, including the Meishin Expressway, will increase to more than 600 kilometers. Of course, this may still be negligible compared with advanced highways in Western countries. But Japan is carrying out, step by step, an ambitious program to complete a nationwide network of 32 speedways covering 7,600 kilometers in 15 to 20 years' time. In this way, Japan is spurting with renewed vigor to catch up with Western nations in the construction of highways.









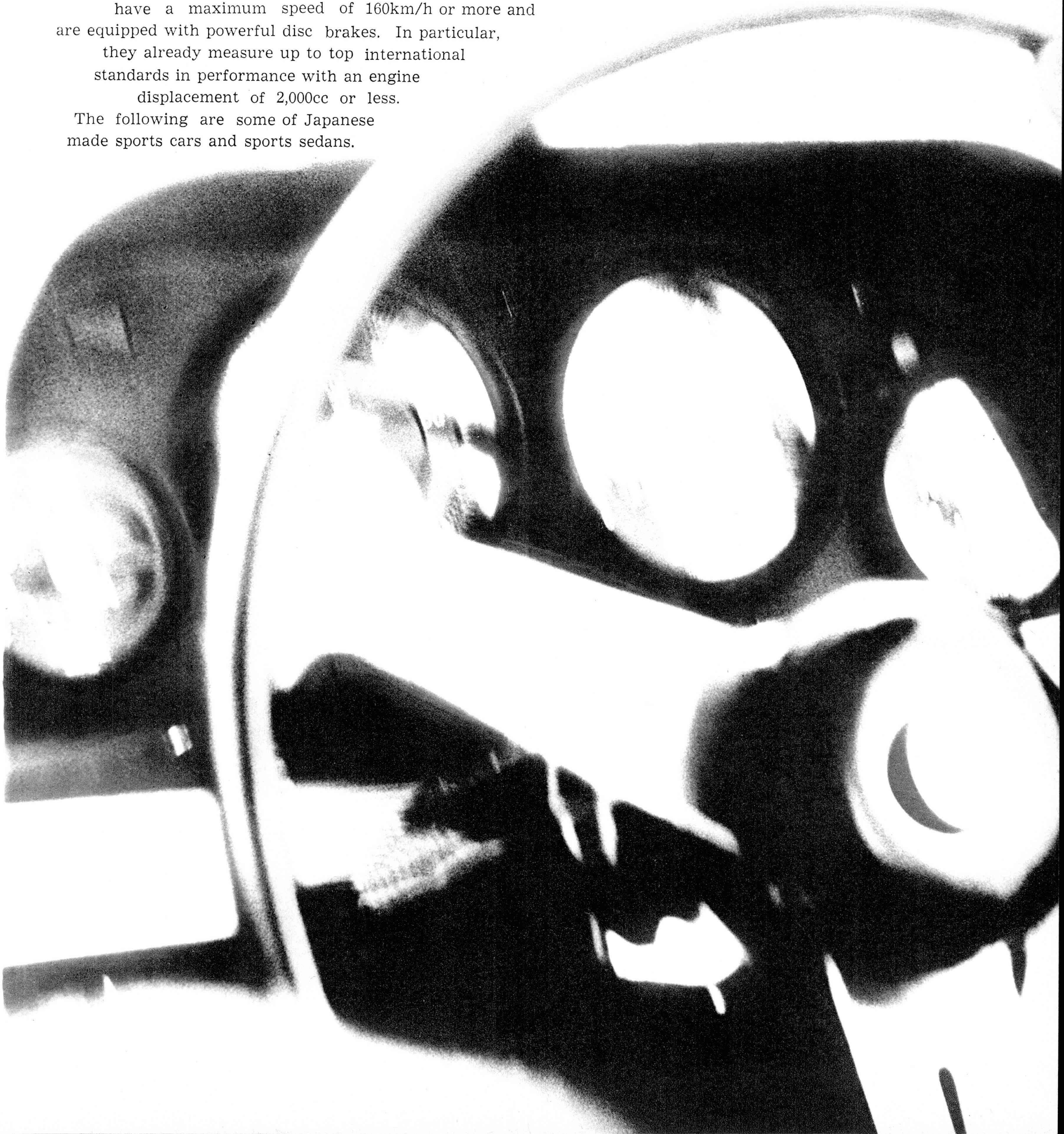
Far left: Tomei Expressway, near Yui.
Left: Guide sign showing a service area.
Top: Tomei Expressway, near Mishima.



Hakone By Pass. Parallel to major expressway projects, speedways are also being built one after another in popular tourist centers.

JAPANESE SPORTS CARS BOAST HIGH PERFORMANCE

The stars of the "highway era" are sports cars—a crystallization of the cream of automotive engineering. Already, Japanese automakers are turning out and selling more than 10 models of sports cars and sports sedans, which have a maximum speed of 160km/h or more and are equipped with powerful disc brakes. In particular, they already measure up to top international standards in performance with an engine displacement of 2,000cc or less. The following are some of Japanese made sports cars and sports sedans.









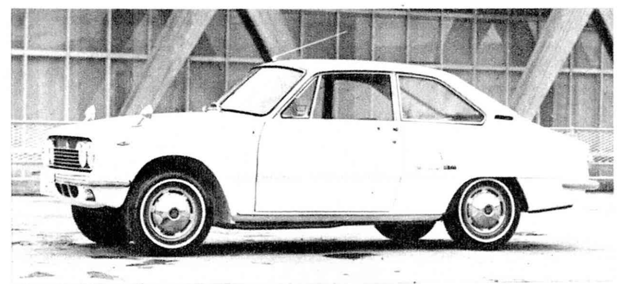
From top to bottom:
DATSUN SUNNY COUPE: Engine displacement: 988cc. Max. output: 60hp/6,000rpm. Max. speed: 140km/h. Domestic price: ¥500,000. (Nissan Motor).
COLT 1200 SPORTY DELUXE: Engine displacement: 1,189cc. Max. output: 62hp/6,000rpm. Max. speed: 160 km/h. Domestic price: ¥615,000. (Mitsubishi Heavy Industries).
HONDA S800M: Engine displacement: 791cc. Max. output: 70hp/8,000 rpm. Max. speed: 160km/h. Domestic price: ¥750,000. (Honda Motor).





MAZDA 110 S: Toyo Kogyo's Mazda 110 S is the world's first sports car equipped with a twin-rotor rotary engine. The revolutionary engine cuts the engine space by half and contributes to silent, high-speed driving comfort. Its 982cc rotary engine generates a maximum output of 110hp at 7,000rpm for a top speed of 185km/h (115 miles/h). The coupe features stick-shift five-speed synchromesh transmission, front wheel disc brakes, as well as comfortable accommodation. Domestic price: ¥1,480,000.









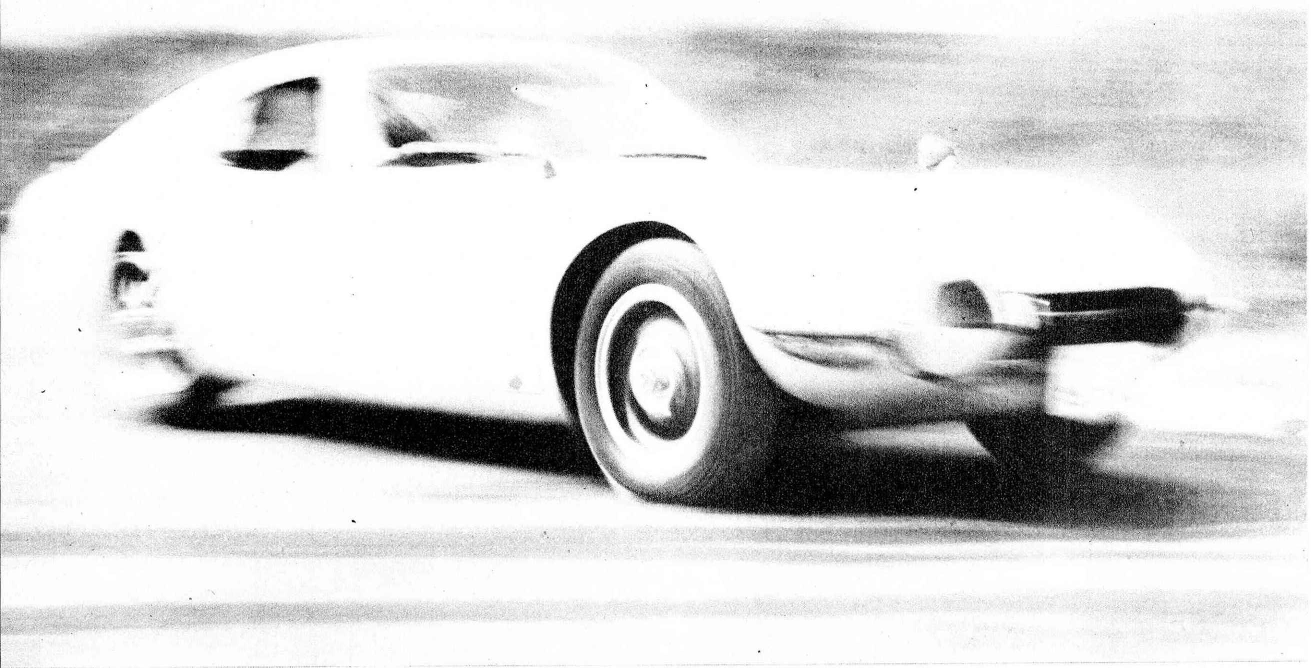
From top to bottom:

SUBARU 1000 SPORTS SEDAN: Engine displacement: 977cc. Max. output: 67hp/6,600rpm. Max. speed: 150km/h. Domestic price: ¥620,000. (Fuji Heavy Industries).

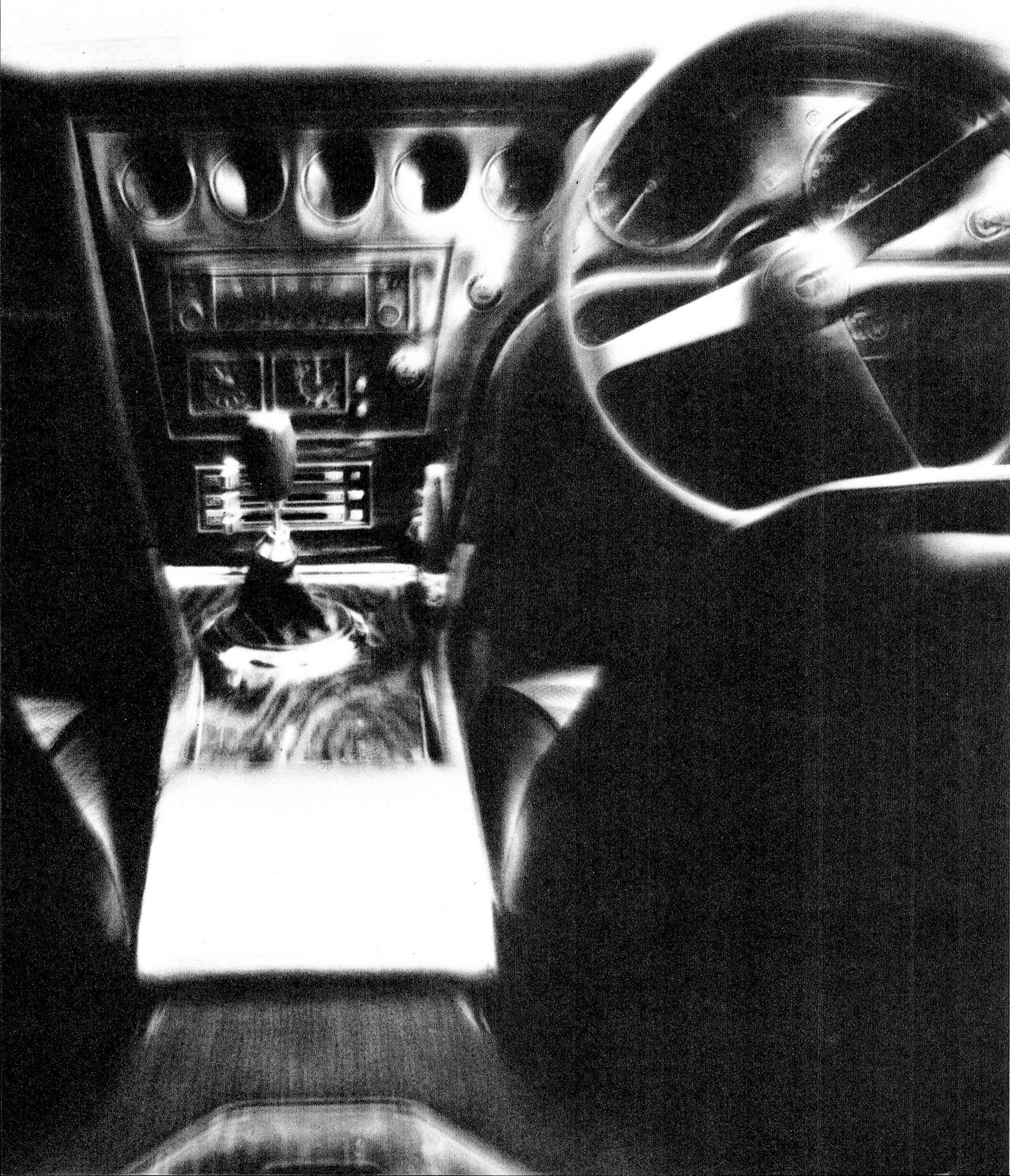
BELLETT 1600GT FASTBACK: Engine displacement: 1,584cc. Max. output: 90hp/5,400rpm. Max. speed: 160km/h. Domestic price: ¥957,000. (Isuzu Motor).

CORONA HARDTOP 1600S: Engine displacement: 1,587cc. Max. output: 90hp/5,800rpm. Max. speed: 160km/h. Domestic price: ¥793,000. (Toyota Motor).

COROLLA SPRINTER SL: Engine displacement: 1,077cc. Max. output: 73hp/6,600rpm. Max. speed: 160km/h. Domestic price: ¥587,000. (Toyota Motor).

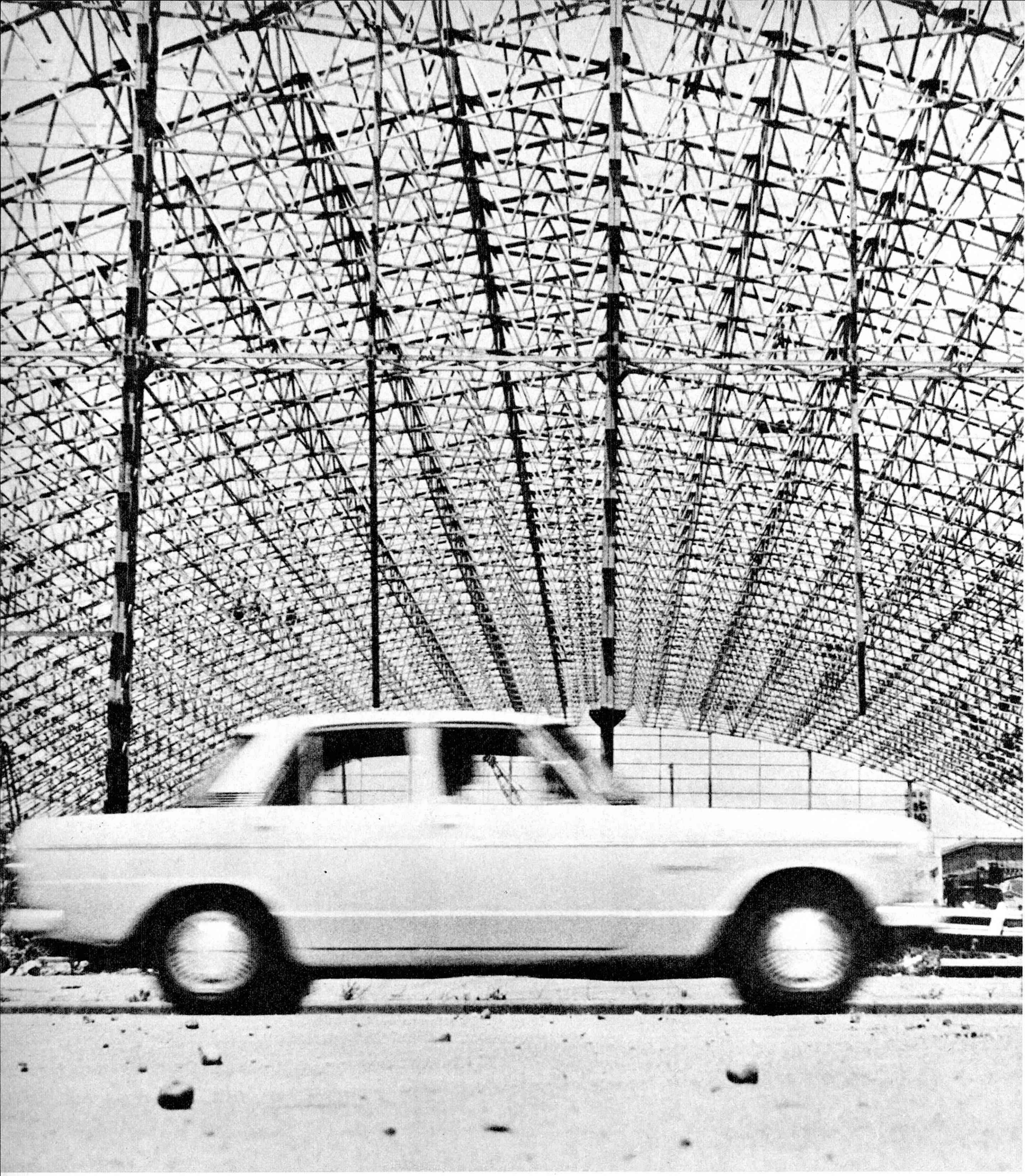


DATSUN 2000 SPORTS: Nissan Motor's Datsun 2000 Sports features an Italian inspired sleek body line. Driven by an overhead camshaft, 1,982cc, four cylinder engine with a maximum output of 150hp at 6,000rpm, it has a top speed of 205km/h (125 miles/h). Five speed fully synchromeshed transmission and front-wheel disc brakes are standard. This sports car not only satisfies the 20-point U.S. safety standard but has eight extra safety features. Domestic price: ¥880,-000. Its high performance is unmatched by any other car within its price range.



TOYOTA 2000 GT: The pride of Toyota Motor is the highest class Japanese made sports car. With a 150hp at 6,600rpm, 6-cylinder double overhead camshaft engine with a displacement of 1,988cc, it can easily attain a maximum speed of 220km/h (138 miles/h). Among its features are fully synchronized five-speed transmission, four wheel disc brakes and independent suspension. This car was introduced to the world through the James Bond movie "You Only Live Twice." Domestic Price: ¥2,380,000. ◄





SKYLINE GT A: Engine displacement: 1,988 cc. Max. output: 105hp/5,200rpm. Max. speed: 170km/h. Domestic price: ¥795,000. (Nissan Motor).



DATSUN 1600 SUPER SPORTS SEDAN: Engine displacement: 1,595cc. Max. output: 100hp/6,000rpm. Max. speed: 165km/h. Domestic price: ¥755,000. (Nissan Motor).

TOWARD SAFER AND MORE EFFICIENT CARS

TEXT by YOSHIO SERIZAWA



Slip test on water-covered road. Tire makers' cooperation is also indispensable for safety.

The successive opening of modern expressways, such as the Meishin (Nagoya-Kobe) Expressway, the Tomei (Tokyo-Nagoya) Expressway and the Chuo (central) Expressway, is leading Japan into a full-fledged "highway age." But Japanese-made automobiles already entered the "highway age" some time ago against the background of active exports to the United States. A remarkable improvement in the performance and speed of Japanese-made cars has been stimulated chiefly by exports to the American market. As much as one-third of Japan's passenger car export, totaling more than 200,000 units worth 200 million dollars, is destined for North America. And Japan's share in the American car market is believed bound to expand further.

In 1966, the U.S. Congress passed the National Traffic and Motor Vehicle Safety Act, which was applied to new motor vehicles from January 1968. This practically came as a supreme order to enhance the safety of cars for Japanese automakers, who depended to no small extent on exports to the American market. In the meantime, the demand for safer cars also mounted at home as a result of a steep rise in traffic accidents and casualties as well as the widespread incidence of "whiplash injury" cases, which though not fatal, posed a serious social problem. At the same time, the expanding network of expressways called for a still higher performance of cars.

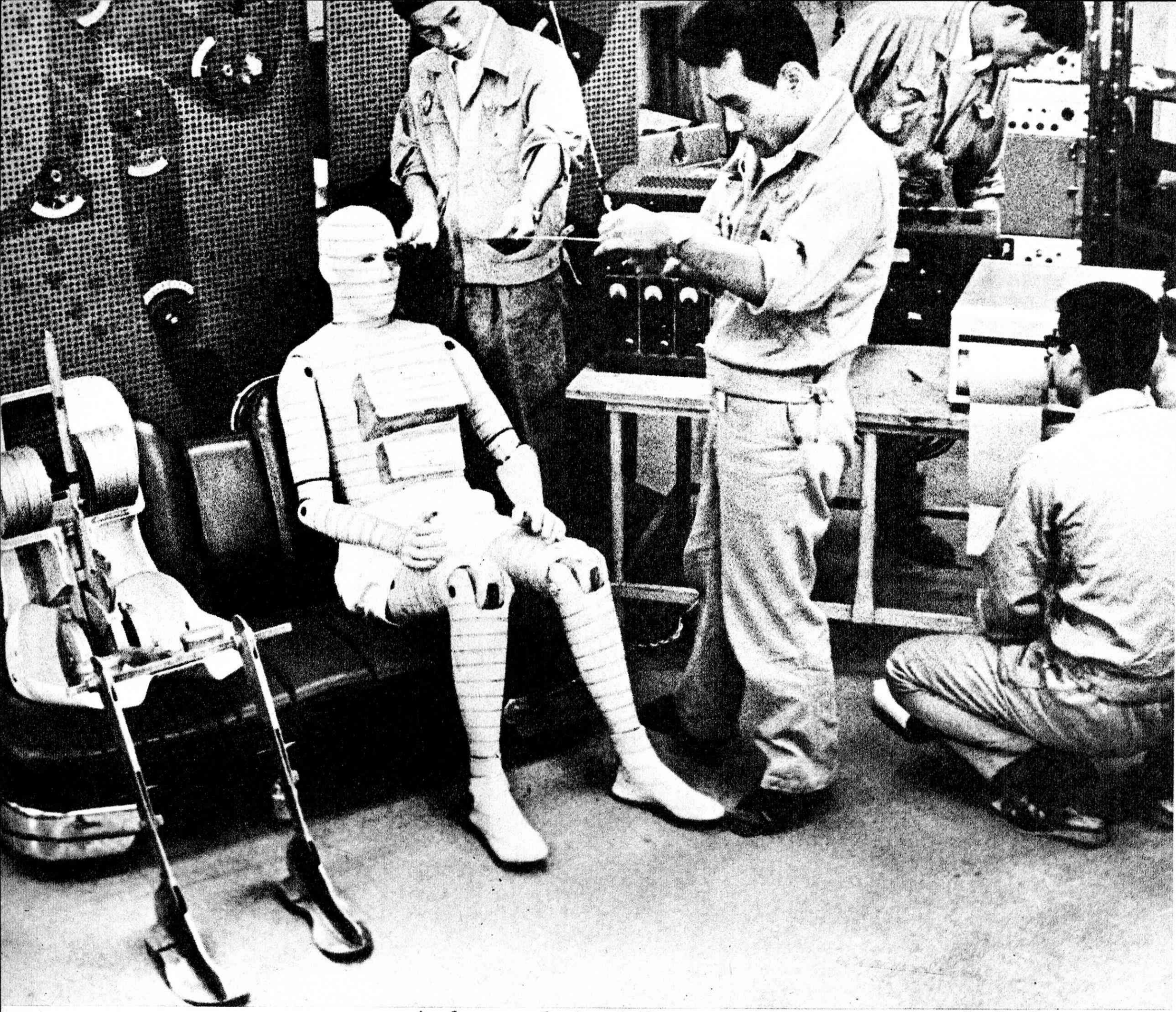
In these circumstances, automakers and specialists, both governmental and private, stepped up their coordinated efforts to elevate performance and safety. Meanwhile, highway test groups were sent to Europe and North America. In addition, test courses and experimental facilities were newly established.

In Japan, there have long since been certain degrees of safety standards in force, but these were not sufficient. When the U.S. worked out a set of safety standards, Japanese automakers transmitted positive opinions to Washington. In particular, they contributed to enlightening the American authorities on the desirable safety standards of small-sized cars. This was because they had become aware of the importance of safety long ago.

In the past year, each maker's safety measures have made rapid progress. Especially, collision test facilities for both car body and component parts have been constructed in large numbers to collect specific data and this effort has started to bear fruit in the actual designing of cars. Meanwhile, the Japanese Government has decided to revise its safety standards to give an exact basis for assessing the progress of makers' safety measures.

To suit an automobile to highway driving, it is generally necessary to increase power and make the car body light and durable for the purpose of cutting weight per horsepower. In this respect, recently announced Japanese cars, excepting sports cars, which are limited in number, already measure up to top international standards. For their horsepower per cylinder volume now stands at about 50 to 60 ps/l. Japanese makers have also started to produce small-sized cars with about the same per-horsepower weight as the larger American cars—that is, 10 kg/ps or less. In this respect, they are already outstripping their European counterparts.

As a consequence, the maximum speed of Japanese cars has reached 140 to 160 km/h (90—100 mph) in the case of general passenger cars—about the same as or higher than that of European cars. Besides, there has also been a marked improvement in acceleration, and the time for acceleration up to 400 m (1 mile) has been reduced below the 20-second level in most models. This may also be said to be higher than European standards.



A close analysis of the structure of the human body is necessary not only to improve safety, but also to ensure a comfortable ride.

Furthermore, sporty coupe models are appearing, receiving an enthusiastic reception among the younger set as high-performance cars.

Nevertheless, high output and high horsepower alone cannot qualify a car as highway vehicle. That is, a number of other requirements must also be satisfied, such as safety during highspeed driving, powerful brakes, limited sound and vibrations, comfortable riding, high stability and a wide field of vision and visibility even in rainy weather and at night.

There are many technical problems regarding compact cars. For instance, since their weight is light, springs must be made soft if the same state of vibrations is to be ensured compared with large-sized cars. But regarding these problems, efforts to achieve the most appropriate design are making marked headway with the aid of electronic computers for theoretical calculations. On the surface, there may seem to be little change. Actually, however, remarkable progress has been made when we examine individual cars. To cite plain examples, models using independent suspension on all wheels have appeared in succession, while disc brakes have been increasingly adopted. Headlights and tail lamps have become brighter, while side flashers have been attached to almost all models.

In short, it may be said, Japanese cars have acquired an adequate capability for high-speed driving.

The increased speed of automobiles has greatly changed the nature of the safety problem. In the past, accidents involving pedestrians and motorcycles accounted for as much as three quarters of traffic casualties in Japan. But of late, their proportion has started to decline. Meanwhile, accidents in major urban centers are on the decrease, while an increase is noted in suburban areas where speed can be raised to some extent. Traffic accidents around lesser provincial cities are also on the rise.

Generally speaking, the impact of a car crash is in proportion to the square of speed. That is, the impact when speeding at 60 km/h is four times as great as at 30 km/h. Therefore, traffic deaths are on a sharp upswing. And to reduce casualties at the time of collision, the following measures are being taken.

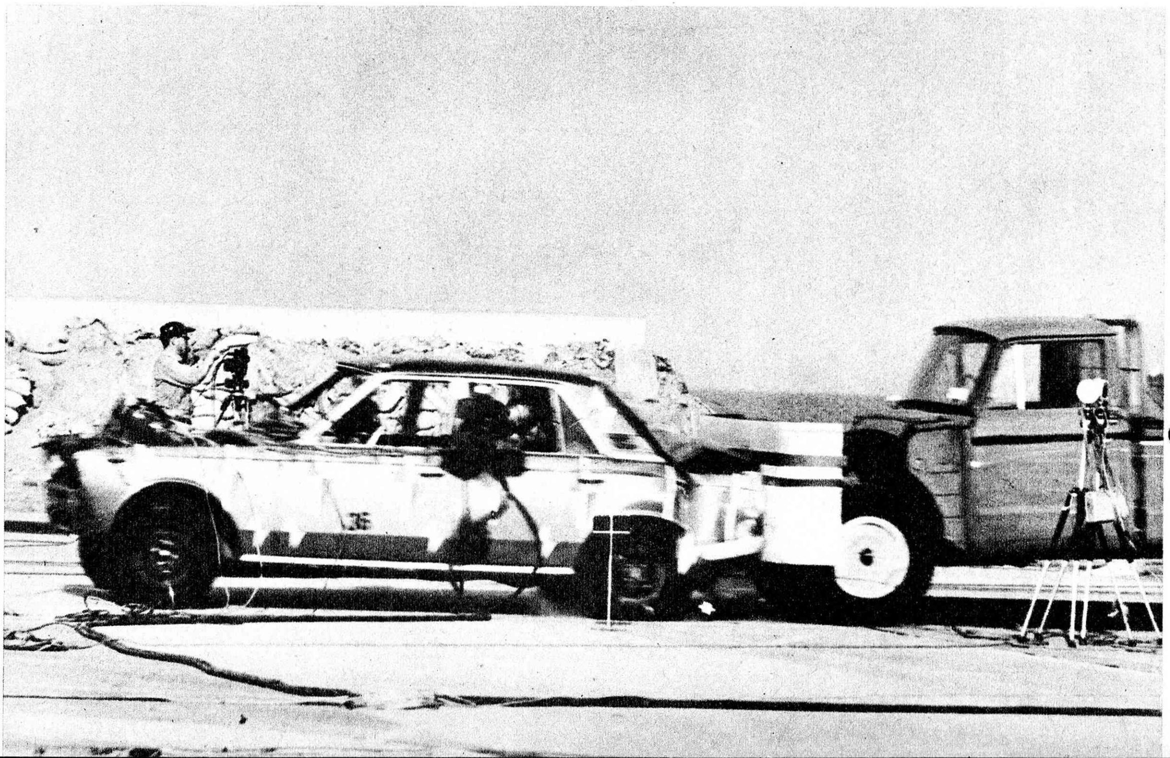
1. Seat belt—This is said to be the most effective means. A lap diagonal belt, it is even said, can save most of occupants even at the time of collision at 100 km/h.

2. Headrest—This attachment is probably in the widest use in Japan as a means of preventing "whiplash injury" when a vehicle is run into from the rear. The installation of a headrest for the driver's seat will become mandatory from next year.

3. Collapsible steering column—This collapses to prevent chest injury to the driver due to impact. The device is compulsory in the U.S., and is also being gradually attached to Japanese cars.

4. Padding of instrument panel—This is designed to cushion impact on the head or knees of the occupant of the front seat. But its effectiveness is reduced unless a seat belt is worn, since the head crashes into the windshield. But this has been adopted for an unexpectedly large number of models, and most Japanese passenger cars have their instrument panels padded.

Left: A passenger car is rammed at the rear by a small truck. Damage conditions of both vehicles are recorded by cameras. Right: Impact on the human body. It shows the need for a full study on seat belt, headrest, steering wheel, instrument panel and windshield.



5. Door latches—Door latches have been improved to prevent the doors opening at the time of impact and occupants being hurled out of the vehicle. In this respect, considerable improvement is observed in all Japanese cars.

6. Strengthening of seat anchorage—This is particularly effective for preventing the front seats from jerking forward upon impact and sending occupants crashing into the front part of the vehicle. The seat anchorage of Japanese cars is being gradually strengthened.

7. Softer front and rear, and stronger interior—A major change hardly perceived by the ordinary driver is that the front and rear sections of a vehicle are used as a cushion to absorb impact energy. A large space scores of centimeters to one meter long is necessary to alleviate a severe impact, and bumpers are scarcely effective. Recent car models have shown marked improvement in this respect to resist impact at increased speed.

A motor vehicle is a typical example of the so-called "man machine system." And there seems little possibility of a new means of overland transport entirely different from the automobile emerging in the next 10 or 20 years. "Motorization" in Japan has not yet reached a peak. Therefore, the spread of motor vehicles will gather added momentum in the years ahead, while efforts will be redoubled to have the improvement of roads catch up with the improvement of motor vehicles in both quality and quantity. In the face of an approaching major ordeal in the form of liberalization of foreign capital investments in the domestic auto industry, Japanese automobile manufacturers are called upon to step up their efforts to make all such unsavory epithets as "traffic war" and "speeding lethal weapons" (that is, motor vehicles) things of the past.

(Mr. Yoshio Serizawa is Chairman, Safety Measures Subcommittee, Committee on Safety and Public Nuisance, Japan Automobile Manufacturers Association)

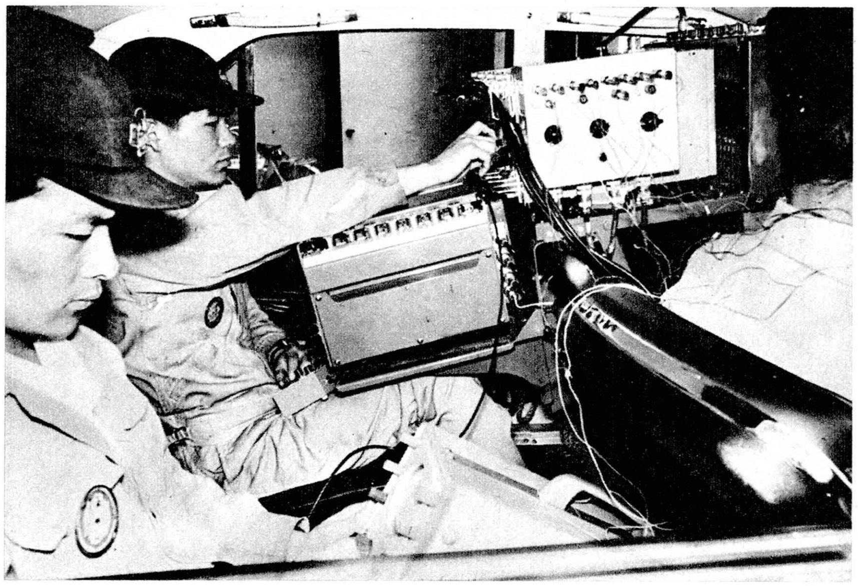


A test on how far a vehicle can tilt without overturning. In some accidents, cars are seen overturned upside down like a turtle.



Experiment in the impact on pedestrian. Various forms of bumpers are being devised to cushion the impact upon the human body.





Driver's tension and fatigue are observed by recording his brain wave, breathing, pulse, etc.



"ORCHESTRA PRIMA ROSA"

All·Female Professional Musical Group

About six months ago Orchestra Prima Rosa, an all-female professional musical group, was inaugurated in Tokyo. This is the first and only orchestra composed of female musicians in Japan, with few parallels in the world. It is now showing fairly active in spite of unkind words behind its back that "any group of women alone will not last long for lack of unity."

The group, comprising of 35 young women who graduated from musical colleges in Tokyo in the spring of this year, was formed at the proposal of Mr. Tadashi Hattori, a noted composer and professor at the Kunitachi Musical College, and its regular conductor.

Since the end of World War II, a rapid spread of musical education in Japan has caused women to advance into the musical world, and many have won prizes at international musical contests. There are as many as four comprehensive musical colleges in Tokyo alone, and their female students continue to increase sharply. In particular, female players of stringed instruments, centering on the violin, have been fostered in growing numbers.

But as elsewhere, women have far less job opportunities than men in the musical world. Even those who are fortunate enough to be engaged by existing orchestras are not accorded proper treatment. According to Mr. Hattori, one of the objectives of the new all-female orchestra is to provide such women with a place to bring their abilities into full play.

Orchestra Prima Rosa centering on stringed instruments also includes wood wind, percussion, harp, piano and organ. Its repertoire consists primarily of romantic type small numbers in keeping with its name. But it is

The orchestra of young women is marked by its visual charm.

not confined to any particular field, and has a wide repertoire ranging from classics to film music, the tango and popular songs.

On June 19 this year, Orchestra Prima Rosa held a concert at the Kosei Nenkin Hall, one of Tokyo's first-class auditoriums. Its performance was fresh and beautiful, and this, coupled with the visual charm of the young ladies, won enthusiastic applause. In July, the orchestra started to appear regularly over the television network of Tokyo's NET, and has apparently established a stable foundation as a professional musical group.

Yet the secretariat of the orchestra has one trouble: all its members are young women of marriageable age. Thus there is always the constant worry that even if a firm sense of professionalism is established among the members, many may get married and leave the orchestra. Nevertheless, Conductor Hattori seems more optimistic, saying: "Well, we naturally can't stop them from getting married. But if only they persist in this business for some time, then we can possibly expect that excellent women musicians will graduate from musical colleges one after another to join our group."

Concert master Miss Atsuko Watanabe, exuding vigor, said cheerfully: "I am very happy every day. At school, I only studied the classics, but popular music is close to everyday life. So I believe such an orchestra as ours has enough raison d'etre. At the moment, I think of nothing but music. Every other member thinks the same way, I think."

When asked about their future, all members replied with one accord: "We hope to make an overseas performance tour."



Members practise hard under the baton of Mr. Tadashi Hattori.



Above: Concert at the Kosei Nenkin Hall. Right: The theme music of Orchestra Prima Rosa is Chopin's Prelude. Its repertoire consists mainly of romantic type small numbers. Far Right: In the dressing room prior to concert. Miss Watanabe (left), the concert master, says: "Now, I think of nothing but music."











The young women still seem to retain the characteristics of students. Their average age 22. Almost all have learned to play the violin and other instruments since five years old.

KAMIKOCHI PLATEAU, CENTER OF THE JAPAN ALPS NATIONAL PARK

The Japan Alps, comprising lofty, rocky peaks more than 3,000 meters above sea level, and capped with snow even in summer, comprise a national park boasting the most impressive mountain scenery in Japan. It is with reason that it is called the mecca of alpinists. Kamikochi, a narrow strip of scenic plateau 1,500 meters above the sea, which nestles in the lap of these high peaks dubbed the "roof of Japan," has endeared itself to lovers of mountains as the "home of their hearts."

In former days, few people visited Kamikochi, which was generally considered a mystic, secluded land deep in the mountains. In recent years, however, it has come to thrive not only as a base for mountain climbers, but also as a summer resort and a tourist spot as a result of a marked progress in transportation as well as improvements in lodging facilities. Nowadays, newly-wed couples on their honeymoon or sprightly girls wearing high-heeled shoes are no longer a rare sight at Kamikochi, bustling with mountain climbers with alpenstocks in hand and rucksacks on the back.

The best season for Kamikochi starts in May when bus service is resumed after a thaw. Until then, everything is covered with deep snow with no means of transport available. Only a few veteran alpinists, eager to challenge the ice and snow-covered peaks, show up at Kamikochi in such conditions. But with the resumption of the bus service, inns and mountain huts reopen, while trees put forth new leaves. But the mountains are still white, to keep the average mountain climber away. In June, when news of early bathers starts to come in from the beaches, spring is at its height in Kamikochi, presenting a fascinating contrast between dazzling verdure and the white peaks. And this is the most beautiful season. With the arrival of the mountaineering season in July and August, the bustling atmosphere of Kamikochi reaches its peak, and every inn is filled to capacity. But with the advent of autumn, tranquility gradually returns. In November, inns and shops shut down. Then everything is once again covered with deep snow, to enter a protracted sleep lasting for half a year. ↙

↙ Incidentally, it was two Britons, William Gowland and Walter Weston, who paved the way for the general public to learn the charm of Kamikochi and at the same time, introduced modern mountaineering as a sport to the Japanese people.

In 1878 when Japan was bent upon assimilating Western civilization, Gowland, an engineer, became the first foreigner ever to scale Mt. Yari (3,180 meters), the second highest peak in the Japan Alps. And it was he, it is said, who christened the area the Japan Alps.

Meanwhile, Weston, who came to this country as a missionary, climbed high peaks more than 3,000 meters above the sea in the Japan Alps one after another from 1891 to 1894 with Kamikochi as his base. Among those he climbed was Mt. Hotaka (3,190 meters), the highest in the Japan Alps and the third highest in Japan. After returning to England, he published a book "Mountaineering and Exploration in the Japanese Alps" in London in 1896, introducing the charm of the Japan Alps to Western nations. The Rev. Weston returned to Japan on two occasions after this, and climbed mountains in various parts of the country over a span of 20 years.

From olden times, there has been what may be called "mountain worship" among the Japanese people, who regard high mountains as sacred. And mountain climbing as an expression of such worship used to be fairly active in ancient times. Mt. Fuji and lofty peaks in the Japan Alps were scaled for the first time by Buddhist priests. Nevertheless,



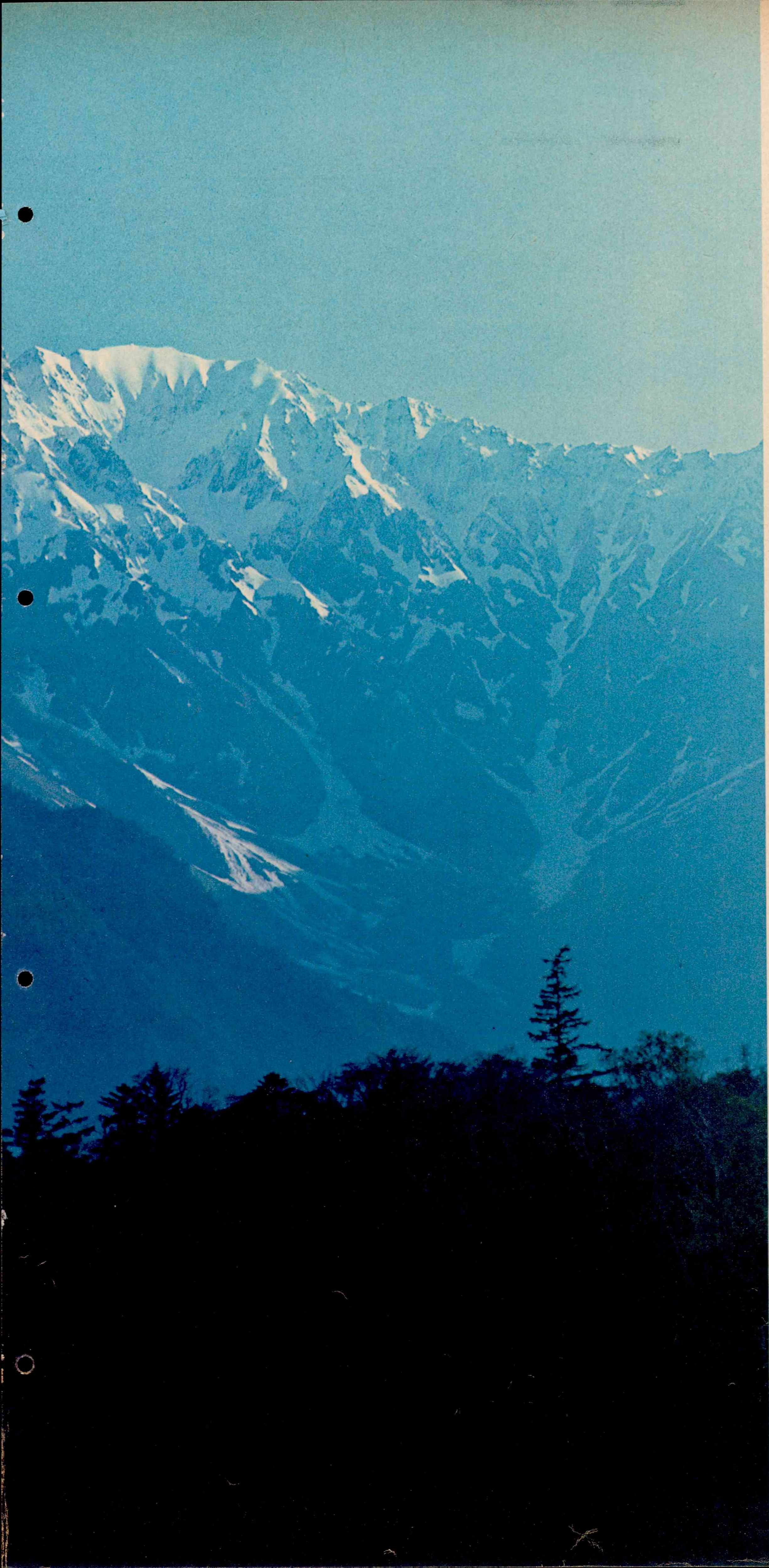
Walter Weston Memorial Relief.

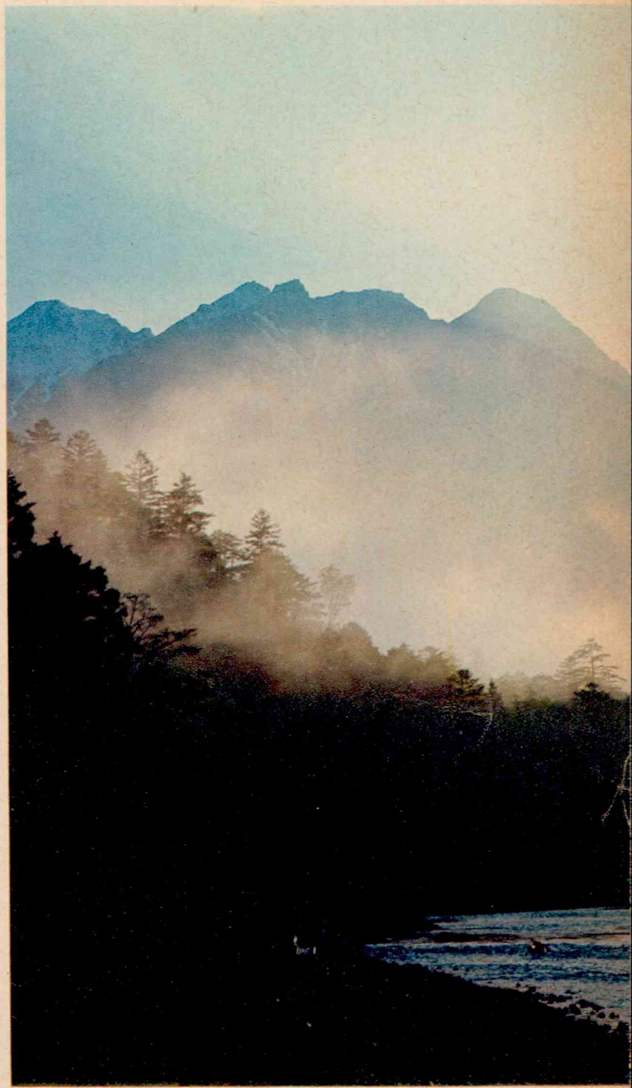
there was no habit of mountain climbing among the general public, and high mountains formed a different world open to small numbers of Buddhist priests and professional hunters alone. For the people at large, the magnificent view of lofty peaks was shrouded with a veil of mystery.

In these circumstances, Gowland and Weston taught the Japanese to enjoy mountain climbing as a pleasant sport. And Japanese mountaineering steadily grew among those who received instruction from the two Britons and climbed mountains together with them. When Weston entered Kamikochi for the first time with a local hunter guide, it is said, the missionary praised the beautiful mountains as rare in the world, predicting the place would bustle with visitors from all parts of the country in the future. This prediction of his came true. The splendor of Kamikochi has now become accessible to everybody. And nowadays, Japan is probably one of those countries where mountain climbing is most flourishing. The techniques of Japanese alpinists already measure up to the top standards of the world as instanced by the world's first conquest of Mt. Manaslu (8,125 meters) in the Himalayas by a Japanese expedition and the achievements of many other Japanese mountaineering teams sent abroad.

A portrait of the Rev. Weston in relief is embedded in a rock on the bank of the crystal-clear Azusa River flowing through the center of Kamikochi. And every year, on the first Sunday of June, many mountain lovers assemble at an open space in front of the relief for the Weston Festival in memory of his great contributions to Japanese mountaineering.







With its fine scenery, beautiful ponds, and cool, bracing air, Kamikochi is ideal for camping, climbing, fishing, boating and other summer sports. Left: Mt. Hotaka, the third highest mountain in Japan, seen from Taisho Pond. Above: Mt. Myojin in a morning mist.





Above: One can enjoy magnificent view of Mt. Hotaka from the Kamikochi Imperial Hotel, only western-style hotel in the area.

Left: Taisho Pond on the Kamikochi reflects the majestic image of Mt. Yake, an active volcano, in its placid waters. The pond was formed in 1915 by the eruption of Mt. Yake.

Photographs by SADAO ICHIYANAGI.

(How to reach Kamikochi) Tokyo—Matsumoto by superexpress train (4 hours); Matsumoto—Shin Shimashima by electric train (30 minutes); Shin Shimashima—Kamikochi by bus (2 hours and a half) or Matsumoto—Kamikochi by taxi (2 hours)

(Where to lodge) Hotel: Kamikochi Imperial Hotel, branch of the Imperial Hotel in Tokyo. In addition, there are 16 Japanese-style inns and mountain huts, including the Nishiitoya and the Gosenjaku-ryokan, both inns. Each mountaineering route in the Japan Alps is dotted with mountain huts for the convenience of climbers.





Taro Okamoto

DIRECTOR OF EXPO '70 THEME EXHIBITION

PREPARATIONS are making rapid headway for the Japan World Exposition, Osaka, 1970 (EXPO '70) to be held in the suburbs of that city for six months from March to September 1970, and the fair site at the Senri Hills is gradually taking concrete shape. To be built in the center of the vast fairgrounds is the Theme Pavilion, designed to show EXPO '70's overall theme "Progress and Harmony for Mankind" from diverse angles. And the director for the theme exhibition of this pavilion, the most important building at the world's fair, is Mr. Taro Okamoto.

In the Japanese "who's who," Mr. Okamoto's occupation is given as a painter. But he is not a mere painter; he is also a sculptor and designer. Moreover, he undertakes architectural projects and writes many books. His activity is thus really colorful. To a question "What is your principal occupation?," he readily snapped back: "Principal occupation? I have nothing of the sort. No



Avove: Mr. Okamoto working on an abstract picture in his atelier. Whatever he does, he gets down to work with astounding energy. Right: Director Okamoto says: "I want to appeal to all visitors about what lies at the root of man in the theme exhibition of the Japan World Exposition, Osaka, 1970."



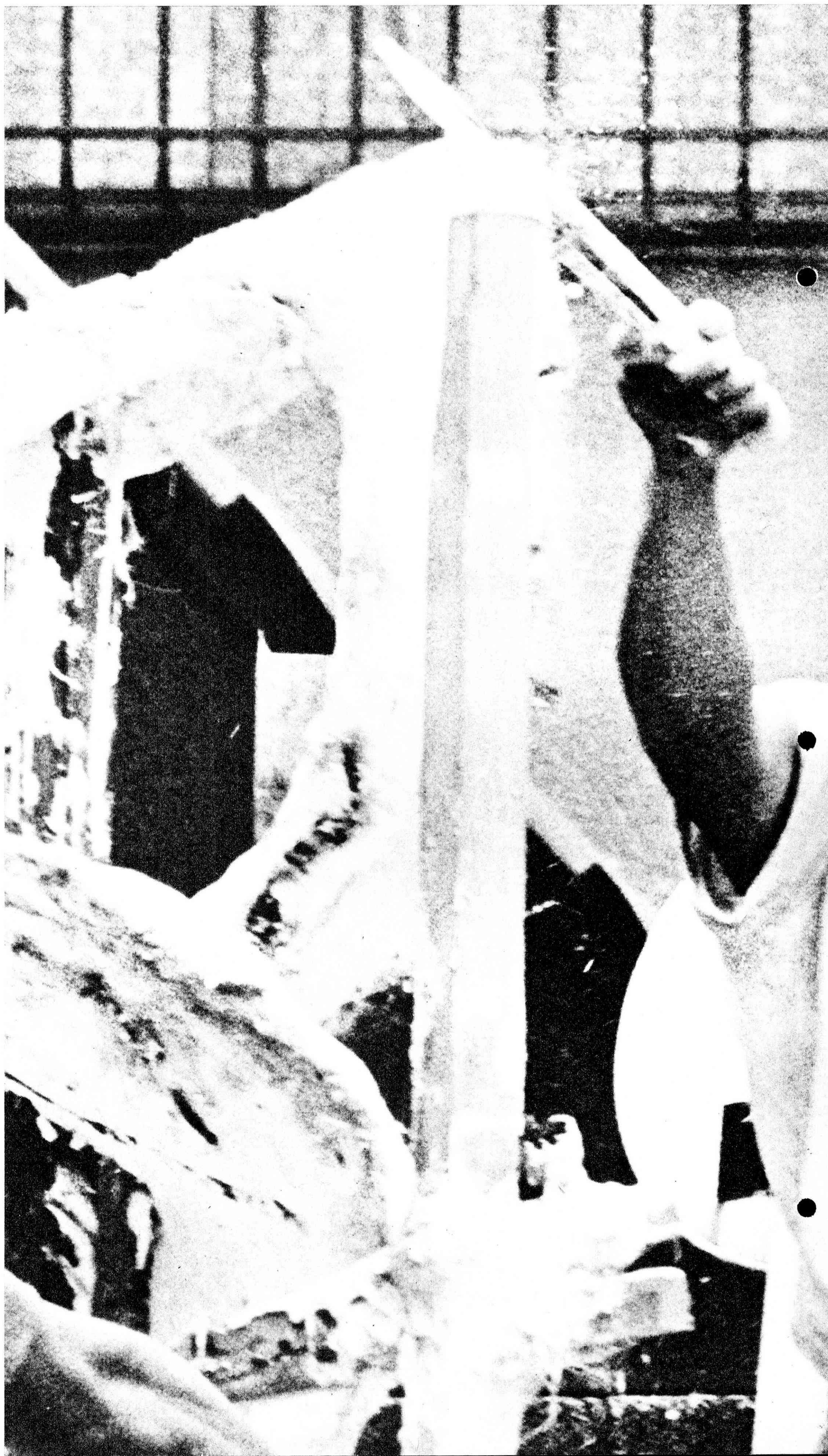
such nonsensical thing, I must say! If you would insist upon my naming a principal occupation, then I could only mention a 'human being' as my job. To live a forceful life worth living and to give a bold expression to an indescribable sense of life or something mysterious in myself—that's exactly how I live. No framework of occupation can restrict my life!"

Mr. Okamoto was born in Tokyo in 1911. His father was Ippei Okamoto, a pioneer cartoonist, and his mother Kanoko, a noted poet and novelist. He went to France in 1929 and stayed in that country until 1940. While in that country, he met Pablo Picasso, and this inspired him to advance into the world of abstract painting. He entered the Salon des Sur Independants in 1932 and made friends with many painters, such as Pieter C. Mondriaan and Wassily Kandinsky, and also studied cultural anthropology at the Sorbonne. After the outbreak of World War II, he returned to Japan and was drafted into military service in 1942, was discharged in 1946 and returned to art. He launched an avant-garde movement, putting a breath of fresh air into Japan's then inert world of art and has since kept up his energetic activities as Japan's typical avant-garde artist.

Mr. Okamoto is extremely busy and amazingly tough. He has a strong personality and his activities are not confined to this country. At present, besides the EXPO '70 assignment, he is tackling the job of painting a giant mural and erecting a monument at the biggest hotel in Latin America to be built in Mexico. Therefore, he frequently goes to the Central American country.

While in the first year of primary school, Mr. Okamoto changed schools four times. For he disobeyed teachers. He could not bear being confined into the conventional framework of an adults' world. This small episode reveals one facet of his personality. In whatever he does, he will not blindly obey the conventional system of values. It is this postuer that forms the backbone of Mr. Okamoto.

Although he spent his youth in Paris, he does not accept the view that Paris and New York are the homes of art. He bitterly denounces those art critics who discuss art only by the yardstick of Western aesthetics. He contends that mankind has a type of







Absorbed in shaping an abstract sculpture.

beauty dissimilar to the so-called Occidental beauty that can be analyzed rationally by, say, the golden section. He points out that in the so-called advanced nations, marked by the spectacular development of modern science and industry, there are many people who, though enjoying the benefits of social prosperity even to an excessive extent, are nevertheless suffering from a desperate feeling of being isolated. Therefore, he argues, we must restore the root of man—that is, the substance of a hot current of life flowing in the depth of man.

ON the basis of such outlook on art and the world, Director Okamoto gives the following interpretation of EXPO '70 and the Theme Pavilion in his charge:

"The past world expositions glorified the progress of science and technology, and showed industrial power of nations. Naturally, therefore, advanced nations in Europe and North America played a principal part in these expositions. At the next exposition in Osaka, the pavilions of the United States and the Soviet Union, for instance, will show off the cream of their science and technology, such as space development and electronics. But Japan will strive not to be outrivaled. All this will no doubt constitute a splendid exhibition. Furthermore, the fair site as a whole will virtually become a contest of experimental architectures. It will indeed be a gorgeous, delightful sight.

"Nevertheless, we must be fully aware that behind such splendor expands a silent but gigantic world—that is, the so-called developing areas or the Asian and African nations that have newly won independence and just started to walk on their own feet. They have nothing in the way of modern industry. If visitors from these nations should feel rather humiliated at the fair, then the advanced nations' boast of wealth or science and technology would have to be described as despicable. On the contrary, the fair must be a place of human pride that will expand all visitors' feeling of their existence in this world and make them blend with the grand festival.

"To my mind, the world exposition can be formed by human factors alone. That is, it can be held simply by the gathering of people from all over the world. Transcending the language barrier, all kinds of gestures by eyes, facial expression, hands and feet will enable



Director Okamoto explains EXPO '70's theme exhibition to a group of scholars. EXPO '70's theme "Progress and Harmony for Mankind" is interpreted by him as follows: "At the present time, mankind has no 'progress.' To be sure, science and industrial power are making progress. Yet what is profoundly human is missing. Unless there is a proper balance between the two, how would you say mankind is making progress in the true sense of the word? 'Harmony' is achieved on a high plane, proceeding from fair confrontation and competition. I interpret it as an exalted harmony. Neutral tints will not do."

all people to contact and confirm each other and enhance their common feelings as living human beings. The significance of the exposition consists in the strong feeling of delight that is born of such human intercourse. Various exhibitions at the fair are nothing more than a means—and an opportunity—of assembling people to that end. That is my basic thought about the world exposition. And it is the Theme Pavilion that will play a central part in providing such an opportunity. So it should transcend all ideologies and make an appeal on the quintessence of man."

THEN let us take a look at the outline of the theme exhibition, which is taking shape under the guidance of Director Okamoto.

The Theme Pavilion consists of three towers rising directly in front when a visitor enters the main gate of the world's fair. The highest one in the middle is the Tower of the Sun standing 60 meters high. It has three faces symbolizing the Deity of the Festival overlooking the whole of the fair site. The faces wear different expressions, designed to make the visitor think of the present, orientate him toward the future and return him to the roots of man. The tower stands piercing through a giant transparent roof covering the Symbol Zone, and symbolizes the ever-progressing mankind. Inside the tower, the visitor ascends it by escalator, while watching the exhibition of the "Tree of Life," which traces the evolution of mankind.

On the left side of the Tower of the Sun stands the Tower of Mother, 21 meters high. The yellow color of this tower stresses the warmheartedness of the mother in contrast with the Tower of the Sun, which may well be called a tower of father. On the right side





Right: Recently, an exhibition of Mr. Okamoto's works, named "TARO EXPLODES," was held at Matsuya in Tokyo. Here he paints an impromptu picture, called "The Sun," on the wall of the exhibition hall. Far right: At his atelier in Aoyama, Tokyo.



rises the Tower of Youth. This 26-meter tower is painted in bright primary colors, accentuating the feelings of youth.

The exhibition theme is displayed at three spaces—underground, on the ground and in the air, symbolizing the past, present and future of mankind, respectively. They also serve as places for expression of the root, progress and harmony of the human race. The underground space below the towers features an exhibition keynoted by the "mystery of life." This space, built like the bowels of a creature, is designed to give to the visitor a chaotic, primitive experience lying at the root of progress and harmony. The exhibition on the ground is based on the theme of "Man and His Life." Many photos collected from all over the world bring into bold relief the diversity and magnificence of man's mode of life, and the feeling that all peoples are fellow human beings. And the exhibition in the air, taking advantage of the inside space under the giant roof, shows through multilateral displays what man's future life will and should be like.

Director Okamoto is now devoting tremendous energy to drawing up a final blueprint of the Theme Pavilion and selecting an assortment of exhibits, on the basis of his firm belief about the nature of the fair, as expressed in his own words:

"The world exposition is neither a sample fair nor a national fair to show off national power. It is a grand festival with the entire world as the stage. A festival must be a thoroughly bright rejoicing. I wish to create and lay out the theme exhibition in such a manner that its boundless charm will at first flabbergast the visitor, but then strongly attract his heart and make him smile a natural, pleasant smile. And I want to confront the visitor with what is fundamental in man."





Mr. Okamoto explains the idea of the "Tower of the Sun."



The "Clock Tower of Youth," designed by Mr. Okamoto, stands at a corner of the fashionable Ginza in the heart of Tokyo. It shares the same image as the "Tower of the Sun."

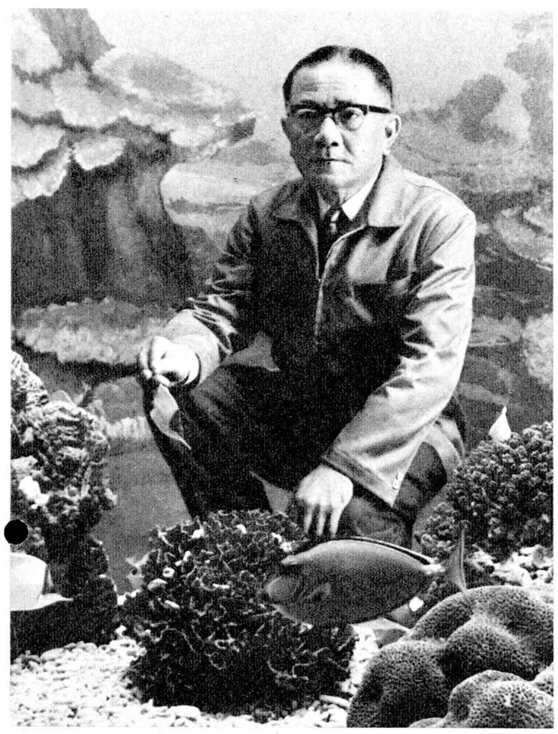
A Unique Aquarium at Aburatsubo

By Dr. YASUO SUYEHIRO
PROFESSOR EMERITUS, UNIVERSITY OF TOKYO
DIRECTOR, KEIKYU ABURATSUBO MARINE PARK AQUARIUM

AQUARIUMS are defined by an encyclopedia as "facilities that have numerous water tanks or the like inside and outside a building to keep diverse water animals and water plants for exhibition to visitors." The first aquarium in the world made its appearance in Bordeaux, France, in 1830, and Japan's first one was constructed at a fair held at Ueno, Tokyo, in 1890. At present, there are about 300 aquariums in the world, including the Shedd Aquarium in Chicago and the Steinhald Aquarium in San Francisco.

Japan has upward of 90 aquariums, and nearly all are still used for the kind of purpose that motivated the establishment of first aquariums in the world—that is, to exhibit as many rare species of water creatures as possible, i.e., in the nature of museums of live ocean creatures. Some of the Japanese aquariums, such as the Marine Palace in Oita, are designed to show the life patterns of water animals to some extent. But most of them are merely trying to outdo one another in collecting as many rare fish as possible at huge expense.

Then what makes people visit aquariums?

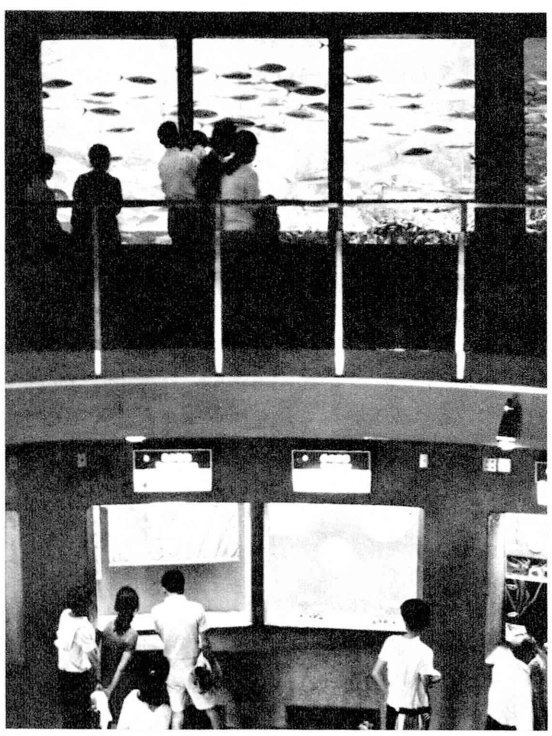


The director of the aquarium talking with fish at the sea bottom? He looks as if he were in the sea, because of special photography.

It must indeed be a great pleasure, for instance, that one can see rare fish of various countries without leaving Japan. Even if one forgets the names of such fish once out of an aquarium, there is a measure of satisfaction in telling others that one saw a strangely shaped fish of, say, the Amazon River at the aquarium. And this, I think, may give some satisfaction to visitors in general.

Nevertheless, now that more than 90 aquariums have been built in Japan, a small insular country, it is highly problematical whether any new aquarium could be a going enterprise if the old-fashioned concept of acquarium is adhered to.

At any rate, it is only natural that an aquarium should strive to let the public take a firsthand look at rare species of fish in the waters inaccessible to us. And this, of course, is very necessary. Yet this factor of rarity need not be confined to the places of origin and shapes of fish. When we think of those fish which are generally deemed familiar to us, do we really know exactly how they look and live in the depths of the sea? Doesn't this constitute an element of rarity?



Along the passageway, an explanation is given to the spectators over the public address system accompanied by a background music.

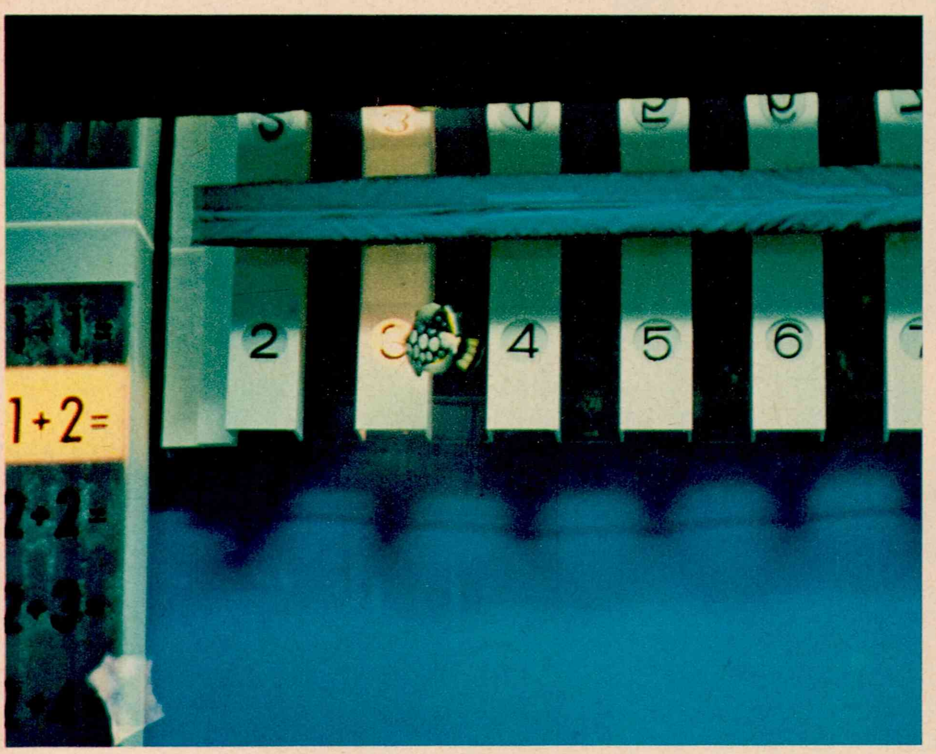
"Tai"—or "Madai" (porgy) to be exact—looks crimson when we see it in a fish shop. But when the fish swims deep in the sea, it looks black because of underwater light. Skipjack is well known to the general public as a fish with vertical stripes. But when this fish is swimming in an open sea, the stripes are hardly visible. Do the people at large know these facts? Some people may have read about them in books or seen them in pictures. But why are there no aquariums for showing such things to the public?

The reason is either that planners of aquariums remain wedded to the old-fashioned idea of merely collecting rare species of water animals, or that no special idea arose in the application of the result of ichthyological research. But the more aquariums are built, the more necessary it becomes to cast away such an old-fashioned attitude by some means or other.

FOR more than 10 years, I cherished the dream of building an entirely new type of aquarium. And this dream of mine has finally come true through the good offices of Managing Director Chiaki Ishii of the Keihin Electric Express Railway Co. That is, an aquarium embodying my dream has been built at Aburatsubo, Miura City, as part of a program to commemorate the 70th anniversary of the founding of the company. Standing on a 39,511-square-meter site, the aquarium, named Keikyu Aburatsubo Marine Park Aquarium, covers an area of 4,444 square meters.

When you enter this aquarium which features a very modernistic design, you first notice a 24-meter-high mural of mermaids on the left, and beside it, Tank No. 1. When you see this water tank, you will never fail to feel that this aquarium differs considerably from conventional ones. For the tank is intended to show the color of the sea and how the colors of salt-water creatures change as the depth increases. That is, special electric lamps with color filters attached are used to give the exact colors of the sea at the depths of 10, 30 and 60 meters. You will see that as the color elements of light are gradually absorbed—that is, red, brown, yellow and so forth, not only the color of sea water but also







Every tank permits visitors to observe the habits of various fish. Top: Spider crabs. Above: A talented fish lights up the correct answer in response to a question put by visitors (photo by the Keihin Electric Express Railway Co.). Right: Yellow tail butterfly fish.

that of creatures undergoes a change. For instance, a red fish looks black deep in the sea, enabling you to observe directly the function of color protection—something you can hardly imagine on land.

In the second and other tanks, a large variety of fishes is exhibited. But unlike conventional aquariums, emphasis of exhibition is not placed on the species. That is, various fish are grouped according to their habitats—namely, fresh-water, brackish-water, salt-water, northern and southern fish, and so on. Moreover, the setting in each tank is so designed to be an exact replica of the actual environment of the fish.

Another unique method of exhibition, presumably never before seen at other aquariums, is to group various fish by their primary characteristics—for instance, tread water, land walking, poisonous and luminous fish. Furthermore, there are various innovations to give a strong impression to visitors and a deeper understanding of fish. For example, horizontal stripes are painted on the background of the tank containing "tread water fish"—namely the sea-horse, which swims with the head up, and shrimp, which swim with the head down. And in a tank containing the "land walking fish" mudskipper, there is a bridge between rocks for the fish to walk on.

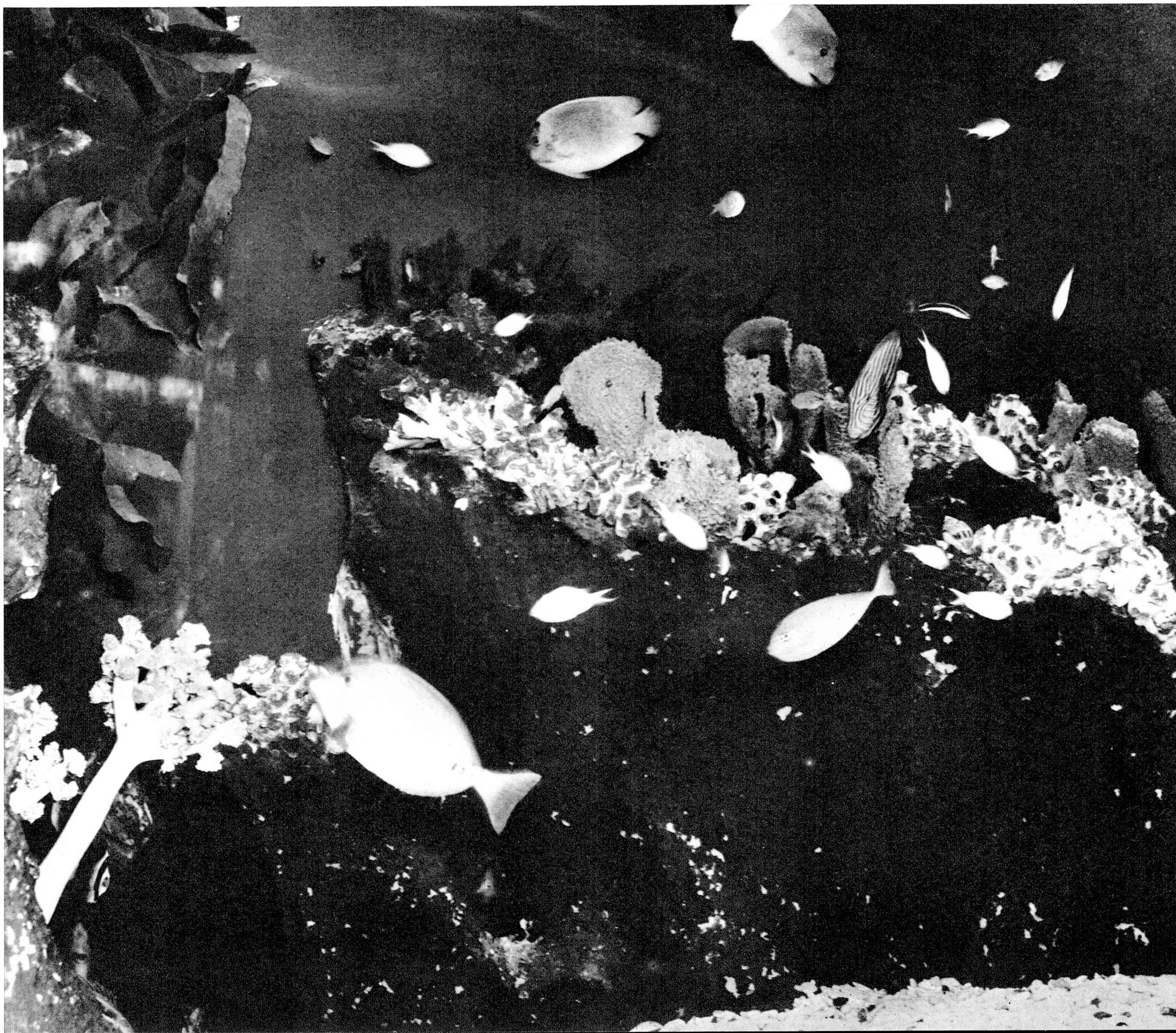
ONE of the attractions at the Keikyu Aburatsubo Marine Park Aquarium are the various "stunts" performed by fish. For instance, there is a tank in which fish do arithmetic. This represents the world's first application of fish training by ultraviolet rays.

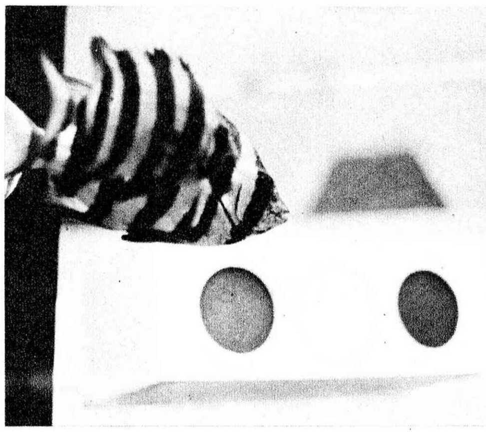
In another tank, schools of fish march ahead and halt at green and red traffic lights. The fish have been trained to do the trick through conditioned reflex to green and red light. There is also a stunt of "fish passing through rings." But this is not a mere imitation of similar stunts by circus animals, such as lions, tigers and dogs. That is, the show at the aquarium takes advantage of the habit of the fish to pass through only round rings, even if there are also square rings. The idea is to show to the visitors that fish are capable of clearly discerning in round, square and triangular forms.

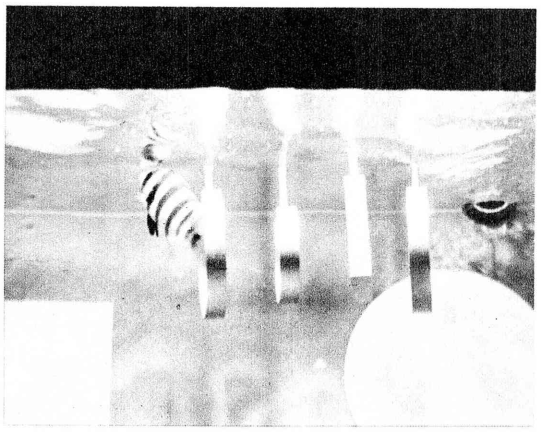
In this way, the "stunts" of fish are not a mere show for tourists, but designed to give an easy-to-understand explanation concerning the results of studies on the sense physiology of fish by the ichthyologists of the world.

We sometimes imagine ourselves diving to the bottom of the deep blue sea, watching porgy, yellow tail, bass and turtles swimming freely around us in a beautiful garden of water plants and rocks. And the Aburatsubo Aquarium enables such a dream to come true. In a giant doughnut-shaped tank with a diameter of 25 meters, you can see a precise replica of the sea bottom where thousands of fish are swimming freely and cheerfully. When you stand at the center of this tank—the pride of our aquarium, you can hardly fail to feel as if you are in a blue flower garden in a land of fish.

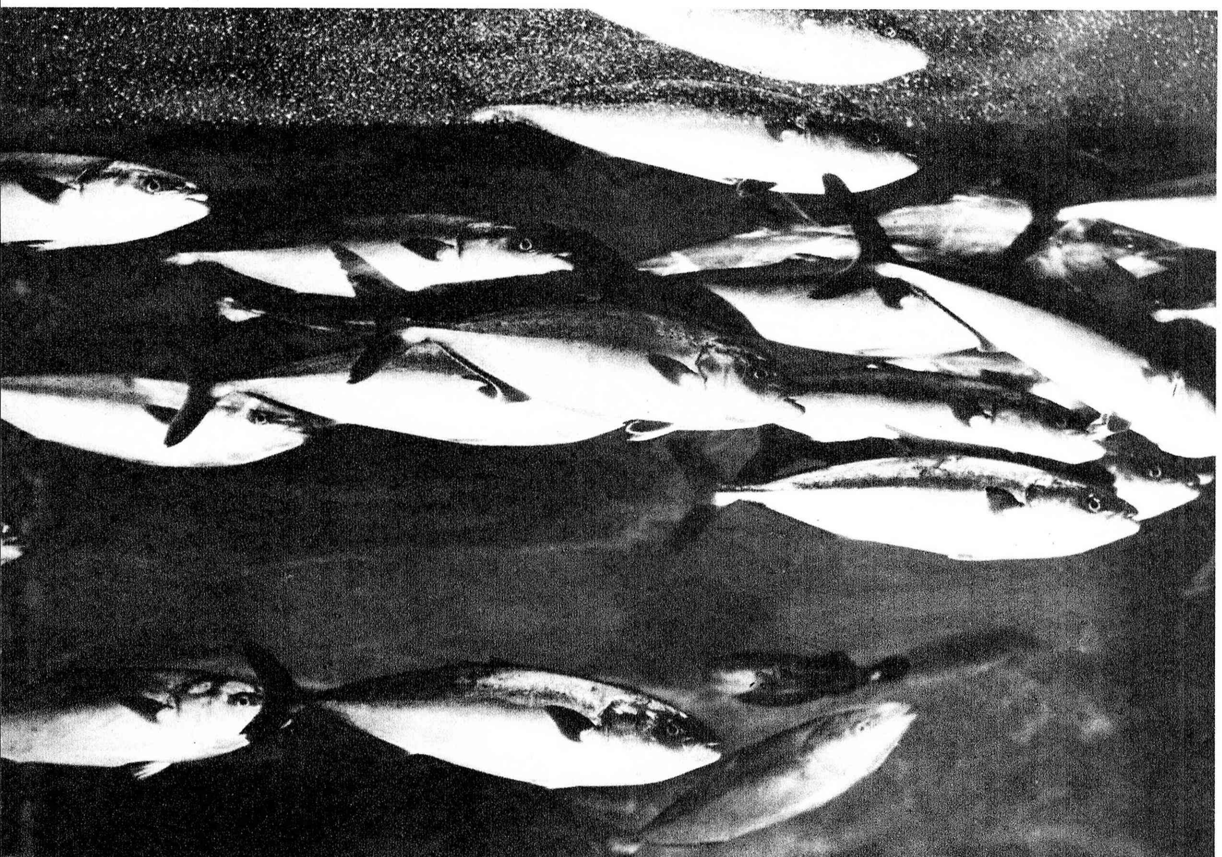
A variety show of sea fish. The background is decorated with sea weeds and shellfish.



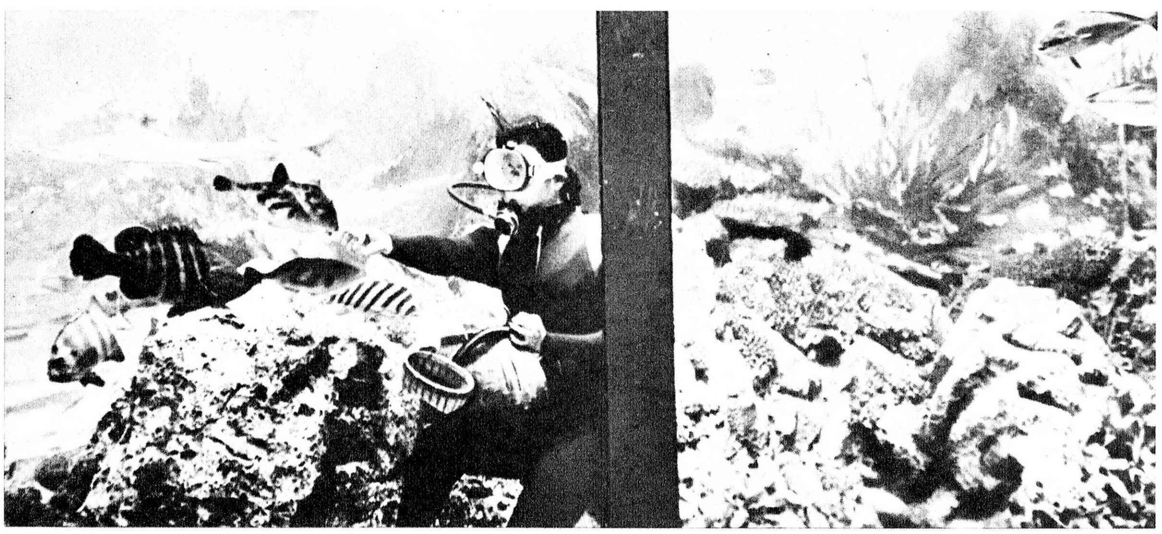


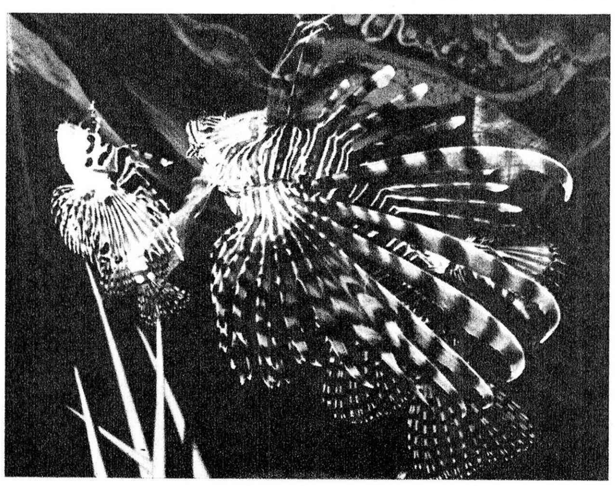


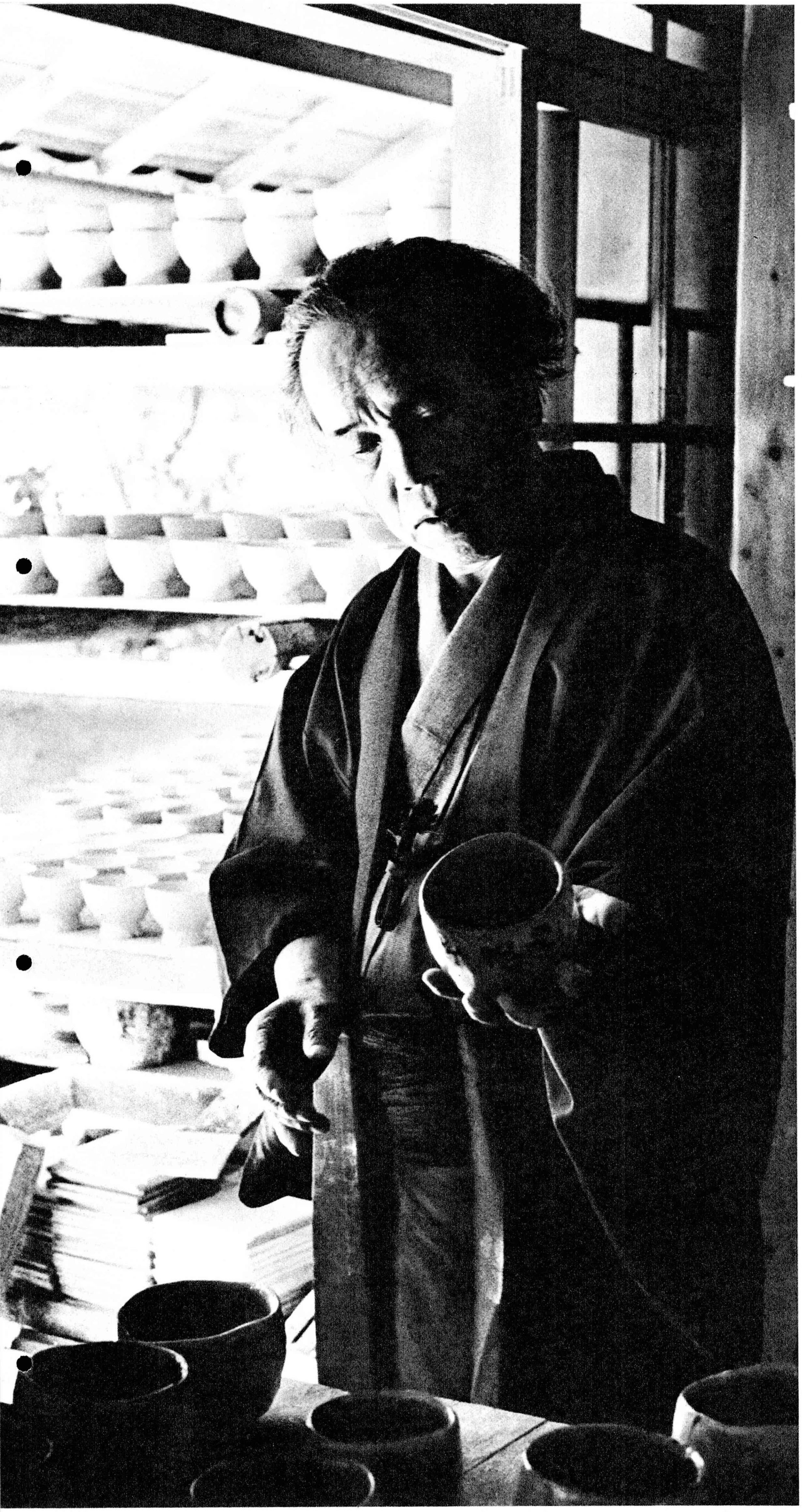
Left: Fish dislike a square form? They pass through circular rings, but never through square frames. Far left: As the signal blinks red, green or yellow, the fish halt or go ahead.



Left: In a giant tank in which 600 tons of sea water is flowing, about 3,000 fishes, such as yellow-tail and porgy, swim about just as they do in the actual sea. Left: She dives into the land of fish five times a day to give feed equally to fish swimming in the upper section of the tank and those in the lower section. Bottom: The water tank of poisonous fish has a wall marked by weird patterns. Needle-like things are properly arranged to accentuate the sense of horror.







LIVING NATIONAL TREASURE

Master Potter

TOYOZO ARAKAWA

BY KUNIO MINAMI
AGENCY FOR CULTURAL AFFAIRS

Looking back over the history of Japanese pottery, we may say that all items, ranging from the *sueki* earthenware, found in ancient tombs, to the color-patterned porcelain of latter days, have been more or less influenced by the ceramics of Korea and China in both technique and style.

However, *chato* (pottery for the tea ceremony), called Shino, Setoguro and Oribe, of the Momoyama Period (16th century) may well be described as the most typical and original of Japan's ceramic heritage.

The masterpieces of *chato,* handed down to this day, were for the most part produced at several kilns in the present Higashi-Mino district of Gifu Prefecture in the short span of half century from the Momoyama Period to the beginning of the Tokugawa Period. Against the background of an "era of energetic war heroes," these ceramics were introduced into a special world of esthetics, called *wabicha* (a type of tea ceremony, featured by serene tranquility).

Soon, however, the art of *chato* waned under the pressure of newly rising potters in

In 1955, Mr. Toyozo Arakawa was designated by the Government as the holder of "important intangible cultural assets"—or a so-called "living national treasure"—for his excellent techniques in Shino and Setoguro pottery.

Photographs by NORIHIRO WATANABE.

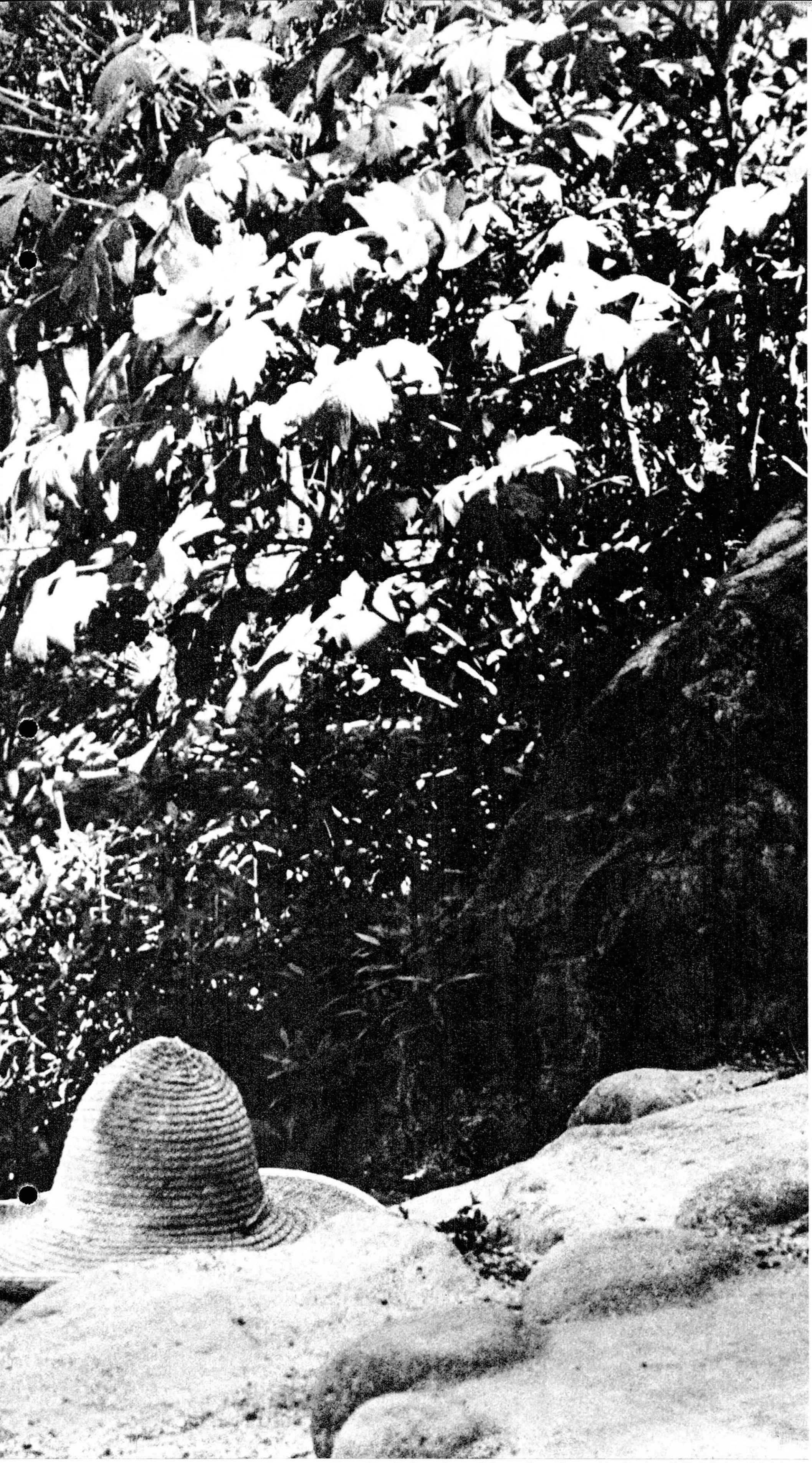


Kyushu. And by the time the Higashi-Mino district started to thrive again as a mass-production center of porcelain ware toward the close of the Tokugawa Shogunate and the start of the Meiji Era, the area's history as the birthplace of Shino and Oribe pottery in the Momoyama Period had been completely forgotten. Until Mr. Toyozo Arakawa discovered the remains of an old kiln for Shino at the start of the Showa Era, people believed that the Shino pottery had originated in the Seto district.

At present, Tajimi and Toki, centers of the ceramic industry in the Higashi-Mino district, bristle with chimneys of modern potteries. The water of the Toki River flowing through the two cities is always turbid and white because of porcelain clay.

Mr. Arakawa was born in Tajimi in 1894. At first, he came to Tokyo to study Japanese-style painting. But in 1922, he started learning the art of pottery under Tozan Miyanaga (1868–1943), then famous as maker of *seiji* (celadon porcelain) and *sometsuke* (blue-patterned pottery). The young Arakawa was supposedly driven to choose a potter's career by the traditional atmosphere of his native land, the birthplace of Mino-yaki pottery, and potter heritage inherited from his mother, whose ancestors included potters. Under Tozan Miyanaga, he mainly studied the art of *sometsuke* and *akae* (red-patterned pottery).

When Rosanjin Kitaoji (1883–1959), noted for his diversified artistic tastes, built the Hoshigaoka Kiln in Kita-Kamakura in 1927, Mr. Arakawa was invited to assist his work.



Mr. Arakawa absorbed in sketching in the garden of his residence.

In those days, he studied a wide range of techniques, including Korean pottery, as well as *sometsuke* and *akae,* and produced many works by these techniques.

And in 1930, a memorable event occurred not only for Mr. Arakawa himself, but also the study on the history of Japanese pottery.

In April of that year, an exhibition of ceramic works made at the Hoshigaoka Kiln was held in Nagoya, when Mr. Arakawa happened to be shown an old Shino teacup with a bamboo pattern by a rich man in the city. Examining the cup, he noticed a modicum of soil attached to the inside of its stand. This caused him to suspect that Shino might have been made in the Mino district. So he went into the mountains of Mino in quest of ancient kilns and finally on April 12th found a piece of bamboo-patterned teacup at the remains of an old kiln at Ohgaya located some seven miles north of Tajimi. Recalling his deep emotion at the time, Mr. Arakawa said: "As I walked back to Tajimi, I took out the piece of pottery from my pocket many times and held it up in the moonlight, smiling with satisfaction."

From that day, years of his pertinacious struggle for the revival of Shino of the Momoyama Period began. Mr. Arakawa established his residence near the remains of the old kiln at Ohgaya, and built a semi-underground kiln of the same type as those which turned out the Shino pottery in the Momoyama Period and absorbed himself in the task of reviving the techniques of Shino. The first kiln proved a failure as well as succeeding ones. He spent a difficult life in the remote mountain where electric power supply was not available until around 1950. But he never gave up. And his admirable perseverance finally brought success.

Mr. Arakawa burns pine firewood in his kiln, requiring a tremendous amount of fuel, for as long as four days and nights to raise the inside temperature up to 1,200 degrees C. Porcelain items, thickly covered with white glaze peculiar to Shino show traditional beauty, reflecting the red fire. The time-honored beauty of Japanese pottery is also impressively revived through the magnificent shape and pitch-dark texture of Setoguro and the incisive style of Kiseto.

In 1955, Mr. Arakawa was designated by the Government as the holder of "important intangible cultural assets"—or a so-called "living national treasure"—for his techniques in Shino and Setoguro pottery.

He said: "It is of course significant to revive the ancient pottery. But we should not be contented with that alone. Now I am determined to find a new Shino." At present, Mr. Arakawa still continues painstaking studies at his kiln at Ohgaya, with his two disciples for the purpose of creating a new Shino. When fancy dictates, he descends the mountain. Sometimes, he goes to Tokyo or Kyoto. He suddenly appears wearing his hand-woven deep-blue pongee *kimono* to remind one of the solemn, dignified personality of a *samurai* of old.

The Shino and Setoguro of the Momoyama Period were born when nature's pure, forceful vitality was tempered by a refined sense of formative esthetics. And this is exactly how the art of Mr. Arakawa has been nurtured in present-day Japan.



Mr. Arakawa continues painstaking studies at his kiln in Ohgaya to create a new Shino.





Many of Mr. Arakawa's works are utensils of tea cult.
Top: Shino-type teacup. Bottom: Setoguro-type teacup.

Photos by Agency for Cultural Affairs.

WILD MAMMALS IN JAPAN

PHOTOS AND TEXT BY KOJO TANAKA

As you see on the map, Japan is a small country comprising a chain of islands stretching from north to south with few species or numbers of wild animals. In this small, overpopulated country, development projects are making rapid headway year by year with roads built even into the heart of the mountains. In remote areas so far noted for the mystic beauty of nature, tourist facilities are developing up in rapid succession. Furthermore, swarms of hunters, using dogs, scour the mountains in serach of game. As a result, wild mammals are vanishing year by year.

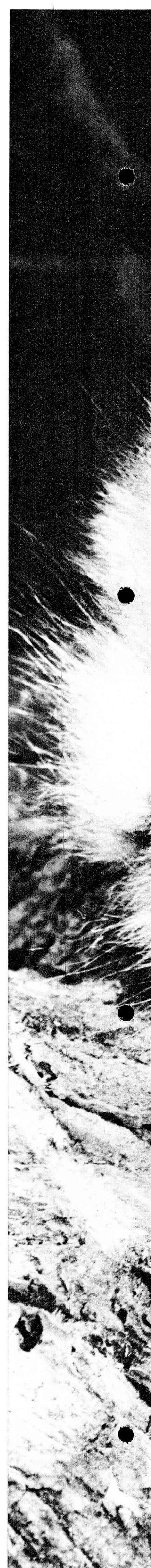
The principal mammals inhabiting the sea around the coasts, fields and mountains are, in order of size, bears, Steller's sea lions, seals, deer, serows, wild boars, otters, Japanese macaques, foxes, raccoon dogs, badgers, gem-faced civets, Japanese sables, weasels, rabbits and hares, flying squirrels, rats and bats.

In the past, few photographs of wild mammals in Japan's natural environment were available. Therefore, I have traveled the length and breadth of Japan for six years since 1962 to take photos of wildlife. Though my work is not yet complete, I published photos of 32 species of mammals, 24 species of birds and six species of other animals in book form this year—namely, the "Wild Lives in Japan," published by the Asahi Shimbun, and "Wildlife in Japan," published by Yamato-Keikoku Sha Co. So I shall be very happy if some of my photos, introduced here, can make readers understand better the wildlife in Japan.

MUSASABI FLYING SQUIRREL *(Color page)*

MOMONGA FLYING SQUIRREL *(Right)*

These animals, being of the same family as squirrels, are very sweet-faced. Moreover, they can glide through the air. They run up high trees and jump into the air during the night. When they extend their fore and hind legs fully, their flying membranes spread like wings. Using their tails as rudders, they dart at the base or branches of trees on the higher ground. From dusk to dawn, these animals glide from tree to tree and branch to branch all through the night in search of food, such as leaf buds and fruit. The longest gliding distance on record is said to be 182 meters. I saw a *musasabi* flying squirrel glide over a distance of about 30 meters from the top of a cedar, about 15 meters high, to a branch of a pasania tree, about three meters above the ground. Flying squirrels are disliked by people in those areas where cedar trees are valued, since they peel the soft bark off the trees for use in their nests. They sometimes build nests under the roof of houses. Their squeaks, sounding "Gyo, gyo, gagah," strike us as very weird. *Musasabi* flying squirrels live in almost all parts of Japan, excepting Hokkaido, the northernmost island of Japan. *Momonga* flying squirrels are small and only about half the size of *musasabi*. That is, they are about the size of a small cat. They also live in Hokkaido.







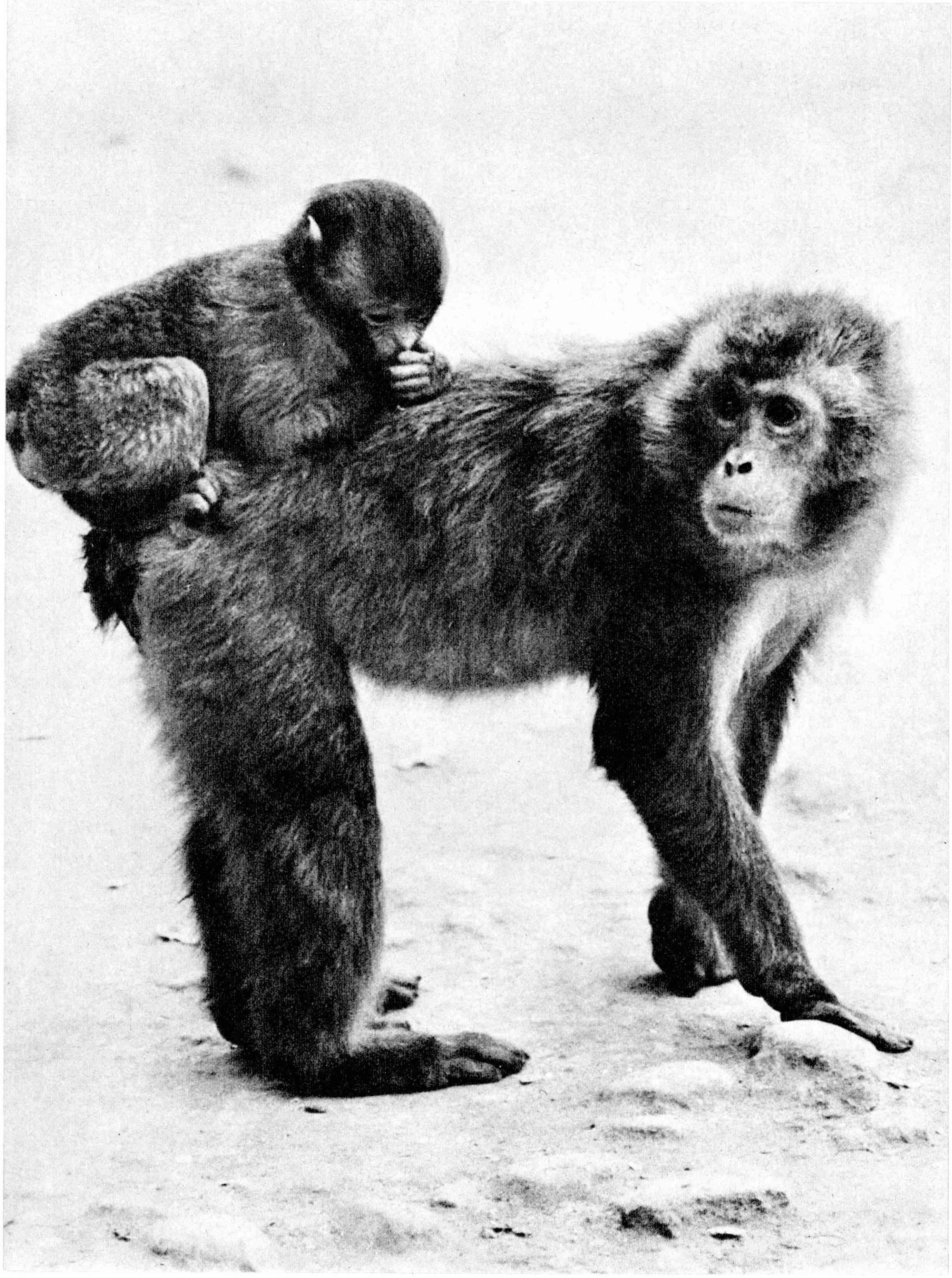
Musasabi.

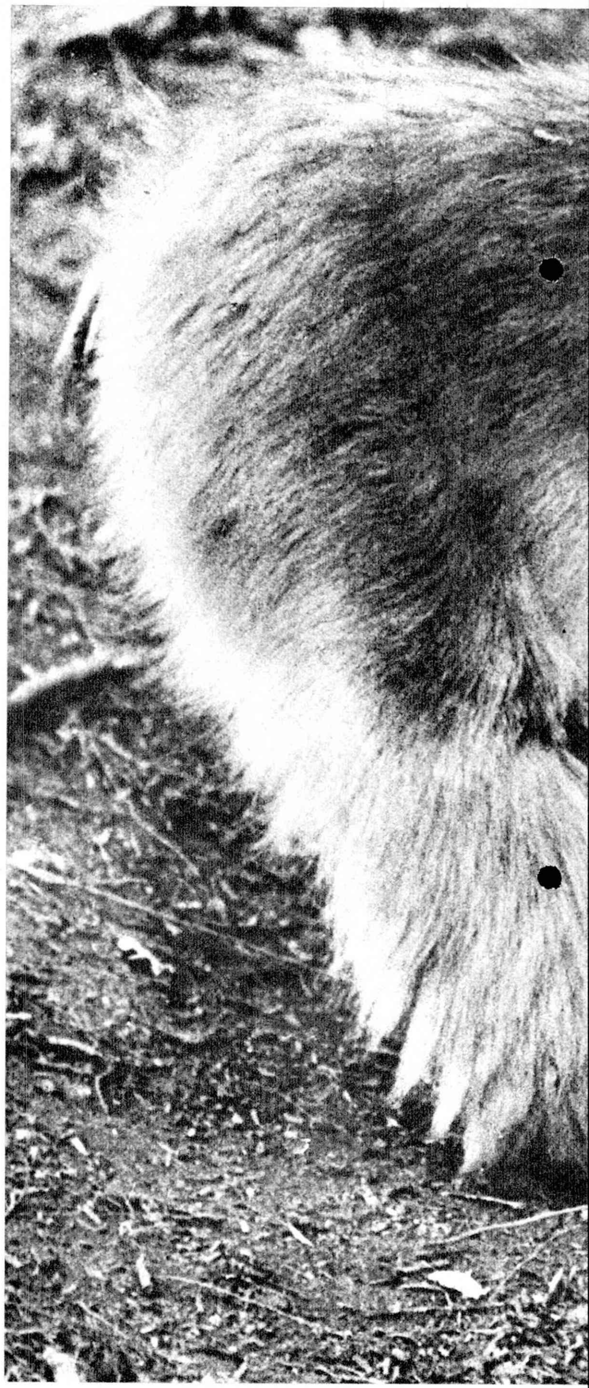


Serow.

SEROW *(Color page)*

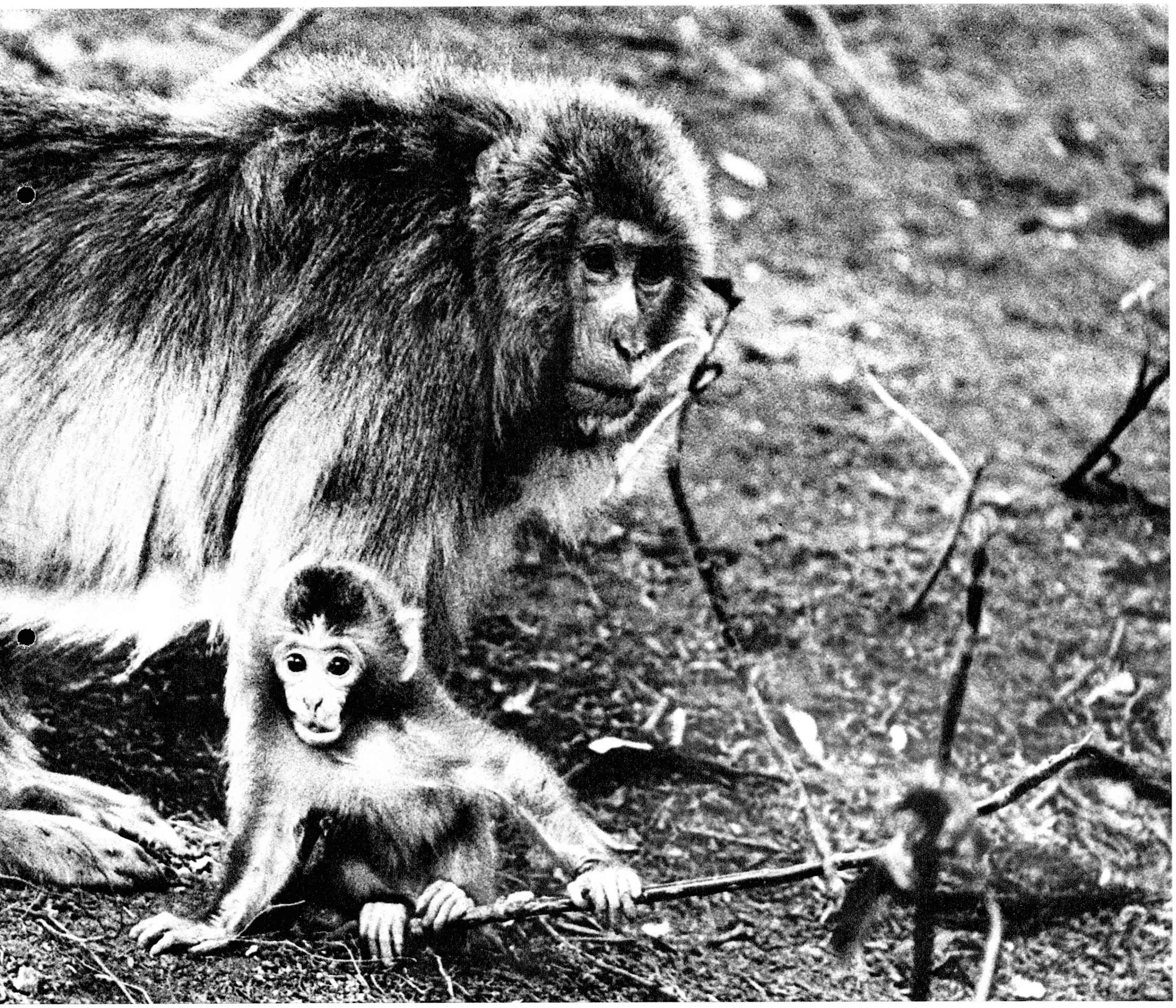
Impalas and Thomson's gazelles in Africa, both fellow animals of serow (in a broad sense), cut very smart figures. But those in Japan are not so, looking more like cows and goats. Nevertheless, since Japanese serows live in rugged mountains and deep valleys, they can cross steep slopes where even dogs cannot climb. They can also jump from inaccessible cliffs. According to hunters, serow's hoofs have sharper edges than those of deer and catch the rocks well. One of the interesting characteristics of serows is the so-called *kan-dachi* (standing in the cold). On a cold winter morning, for instance, a serow is often seen to be standing on a rocky mountain for hours on end. When pursued by hunting dogs, serows tend to escape to a safe place where they stand for hours. But this makes them an ideal target for hunters. Until around the end of World War II, serows were shot at random. At present, this animal is protected as a "special natural monument." Consequently, their number seems to have increased considerably. Serows living in the Aomori district in northern Japan are rather whitish, while those in the Suzuka Range in central Japan are blackish in color.





JAPANESE MACAQUE

Japanese macaques live in the most northernmost areas among the monkeys of the world. Their habitats extend as far north as the Shimokita Peninsula, Aomori Prefecture, in northern Japan. In Nagano Prefecture, there is a famous hot spring where monkeys living in the snowy mountains occasionally take a bath. Japan's research on monkeys is one of the most advanced in the world and exhaustive studies have been made into every aspect of their life, such as their languages, family composition, and group of life. On Mt. Takasaki, Kyushu, nearly 1,000 monkeys gather to receive food from people. The sight of monkeys chasing human beings is not unusual at this feeding place on the mountain.





CHIPMUNK

There are three species of squirrels living in Japan—that is, Ezo squirrels and chipmunks in Hokkaido, and Hondo squirrels in Honshu. Ezo squirrels and Hondo squirrels are large and brown, building nests in trees. But chipmunks are small and have five black stripes on the back. They burrow nests under rocks or in the ground. Chipmunks have cheek pouches into which food can be crammed and which they carry to their burrows for storing. That is why this squirrel appears in the advertisements of banks. Unlike the two other species of squirrels in Japan, chipmunks hibernate in winter. When the snowy season sets in, they sleep in the ground. On warm sunny days, they awake from time to time to relieve nature and eat stored food. Usually, they do not squeak often. But a chipmunk I keep frequently utters a sound like that of a dove early in spring presumably to call a mate. This animal mainly lives in the high mountains of Hokkaido, although it is also seen on flat land. Chipmunks are seen very often near mountain huts and on camping grounds on Mt. Daisetsu and Mt. Ashibetsu, for instance. When hikers open their lunch baskets, chipmunks scurry about near them. The merry atmosphere of the animals has made them popular among mountain hikers, who regard them as their mascots.









WILD BOAR *(Above)*

The wild boar's young is called *uri-bozu* (melon boy) in Japan because of strange stripes on its body. This wild boar, photographed in the Tanzawa Mountain Mass at night, was a young one still with the remnants of such stripes. Its big nose similar to that of hog (anyway, hog was originally made by domesticating the wild boar) has an acute sense of smell. Since wild boars have no particular weapon, their nerve system for detecting an enemy so as to escape quickly before being attacked has probably developed to a great extent. As a Japanese saying advises, "a wise man never courts danger." Once we leave a scent, wild boars will not approach the place for nearly a week. They can keenly sense if a trap is laid or not. And they are even astute enough, to outwit veteran hunters.

SHIKA DEER *(Right)*

Unlike serow, cow and sheep, the deer molts its horns every year. As for Japan's *shika* deer, only males grow horns, and females have none. In winter, they look brownish and are not very pretty. But from early spring to summer, white spots appear on their bodies, and infant deer are particularly beautiful. Deer live in groups, and when I tried to approach a herd to take pictures by concealing myself behind one of them, other deer instantly spotted me and uttered a peculiar warning sound. So it is very hard to take their pictures. Deer living in Hokkaido, called Ezo deer, are very large. But those on the Yakushima Island, Kyushu, are small and the branches of their horns are one less than those of other deer.



TOYAMA TRAFFIC PARK, A MODEL CITY IN TOKYO

A unique children's park is located in the heart of Tokyo where they can ride go-carts to their hearts' content amid a "real" environment—traffic signals, crossings for pedestrians and even traffic cops, who are watchful against violators of regulations but kind to those obeserving them. This is the Toyama Traffic Park operated by the Tokyo Metropolitan Government.

From the adult's point of view, it is "not only a playground for children, but also designed to have them learn traffic regulations and ethics through healthy play." But children do not care exactly what has promoted the establishment of the park or for what it exists. They just gather if only they can have a pleasant time. And so, every weekend, more than 500 children converge on the park.

The park represents a model city divided into three blocks—urban center, immediate suburbs and suburbs. And they are criss-crossed by highways. When a child drives a go-cart along the highways, residential, industrial and commercial areas, and wooded hills emerge one after another. There are also "real" level crossings with suburban railways and grade separation crossings of highways. Everything is just the same as when children ride in cars operated by their fathers, except for only one difference—it is the children themselves who are in the driver's seats. Why, that pedestrian is ignoring the traffic signal! How annoying—that patrol car following close behind!

Children of course behave as if they were adults. When a collision occurs, a verbal duel as heated—or more heated?—as is the case with adults breaks out.

It is already four years since the park was opened. But it still attracts swarms of children. It may be said, therefore, that adult's plan to teach traffic regulations and ethics has proved a success.







The park has an area of about 20,000 square meters and the total length of the highways is given as one kilometer. For "safety first," the maximum speed of go-carts is limited to 20 kilometers per hour. They are equipped with special bumpers and mufflers. Parents sometimes complain, "all you do is to play from day to day," or "that is not the type of thing a girl should do," but children can't resist the thrill of go-cart driving.


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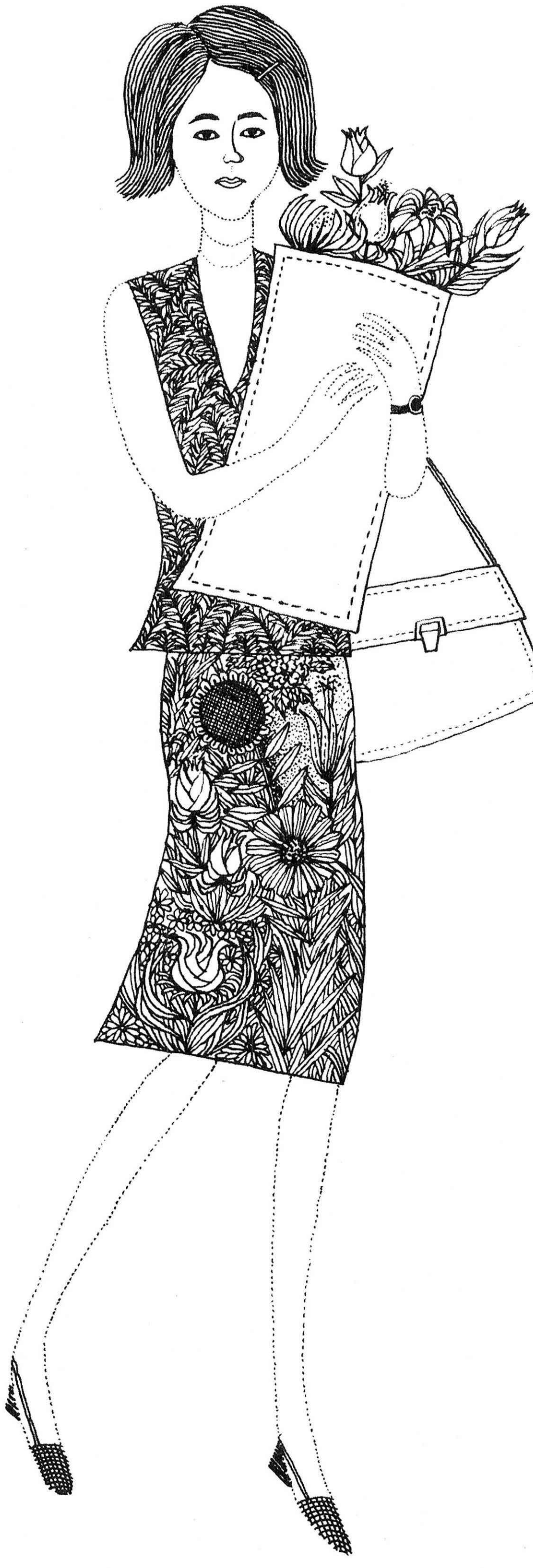

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EDITOR: Mitsuo Suzuki.

EDITORIAL STAFF: Masami Suzui, Taisuke Tsuno.

LAYOUT: Koji Detake, Ranko Fukui.

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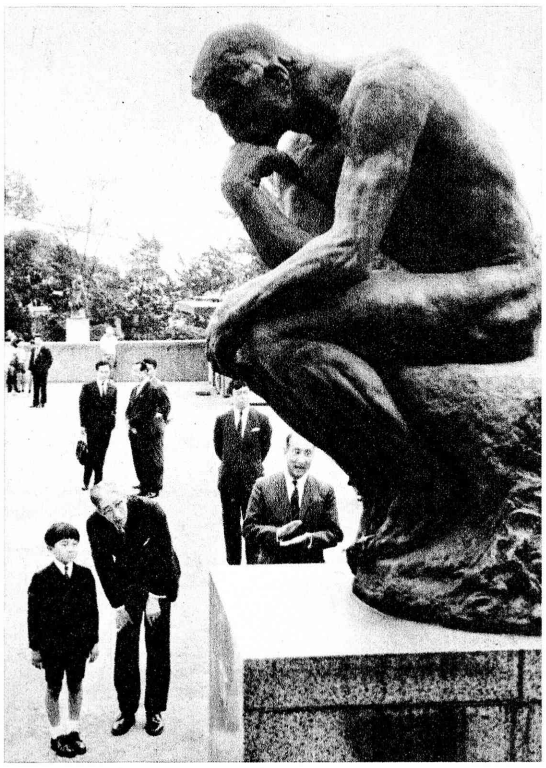
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Japanese Currents

IMPERIAL FAMILY

Prince Hiro Admires Rodin's Works



Autumn in Japan is a season for the fine arts, and multitudes of people flock to art museums and exhibitions. One Sunday toward the end of September, Prince Hiro (elder son of Crown Prince Akihito and a third-grader at the Gakushuin Elementary School) visited the National Museum of Western Arts in Ueno, Tokyo.

A juvenile encyclopedia, used by Prince Hiro, contains reproductions of famous Western pictures by Cezanne, Renoir and other painters. Charmed by them, the little Prince decided to see them at first hand and asked to be taken to the museum.

Wearing a double-breasted dark blue suit and a polka-dot tie, Prince Hiro arrived at the museum to be greeted by many visitors. With Director Tomosaburo Yamada of the museum acting as guide, he first saw and greatly appreciated Auguste Rodin's "The Thinker" (photo) and then the masterpieces of such painters as Gogh, Millet, Cezanne, Renoir and Monet. The young Prince's knowledge of Western fine arts came as a great surprise to Director Yamada.

TOKYO

Airship Over Tokyo

Hiryu, a silvery airship, made its long-overdue appearance over Tokyo on a cloudless autumn day, causing thousnds of pedestrians to halt briefly to look up at the cigar-shaped dirigible. It was part of a nationwide demonstration flight of the airship bought from West Germany by the Japan Airship Co. of Tokyo to publicize a manufacturer of electric home appliances. The 49-meter long six passenger airship reminded older folk of the Zeppelin which visited Japan in 1929, but youngsters seemed flabbergasted at the sight.



SCIENCE

Japan's Space Development in Full Swing Again

Tokyo University's Institute of Space and Aeronautical Science and the Science and Technology Agency conducted a series of rocket launchings in mid-September. This put Japan's space development projects in full motion again after one year and five months' suspension since April last year (due to fishermen's opposition to the establishment of impact zones in their fishing grounds.)

The Institute of Space and Aeronautical Science launched seven small rockets from its Kagoshima Space Center at Uchinoura, Southern Kyushu, by way of preliminary test for the launching of a Mu-4S rocket in 1970 to send a scientific satellite into orbit. On September 10, the No. 1 rocket of the ST-160F type was sent aloft to test the performance of six flares, planned to be attached to the Mu rocket to ensure stability in flight. Then on September 12, the No. 1 rocket of the SO-160 type was launched to test a device to halt the thrust of the Mu rocket and let it fall in case it develops trouble while in flight. Both tests proved highly successful, brightening prospects for launching of the Mu rocket.

In the next test series scheduled for January next year, the institute intends to launch the giant four-stage No. 4 rocket of the Lambda-4S type capable of lifting an artificial satellite into orbit.

The Science and Technology Agency, meanwhile, launched three rockets at the National Space Center at Tanegashima Island south of Kagoshima. Especially noteworthy was the successful firing of the LS-C-D rocket on September 19. This was Japan's first attempt to develop a liquid fuel rocket. (Tokyo University's rockets are all propelled by solid fuel.) The planned rocket is to form the third stage of a giant four-stage rocket to be launched in 1973 to orbit a stationary communications satellite.

Under Japan's space development program, Tokyo University is charged with the task of developing scientific satellites, while the Science and Technology Agency is assigned to develop satellites for practical use. The purpose is to clarify various space phenomena scientifically and at the same time, to use space for practical applications, such as communications, broadcasting, meteorological observations and navigational aids.

NEW PRODUCTS

Collapsible Skis Make Debut

"Collapsible skis," the first of their kind in the world, will make their debut in Japan in coming skiing season. Hitachi Chemical Co., the manufacturer of the glass fiber collapsible skis, reports that the new skis, foldable at midpoint, will be very convenient for carrying in trains or cars. When in use, they

appear little different from ordinary skis, because their connecting parts are collapsible. The company has obtained a patent for the connecting method in Japan and also has applied for the patents in the United States, France, West Germany, Canada and Austria. In performance, Hitachi Chemical claims, the new skis are better than ordinary ones in some points.



TECHNOLOGY

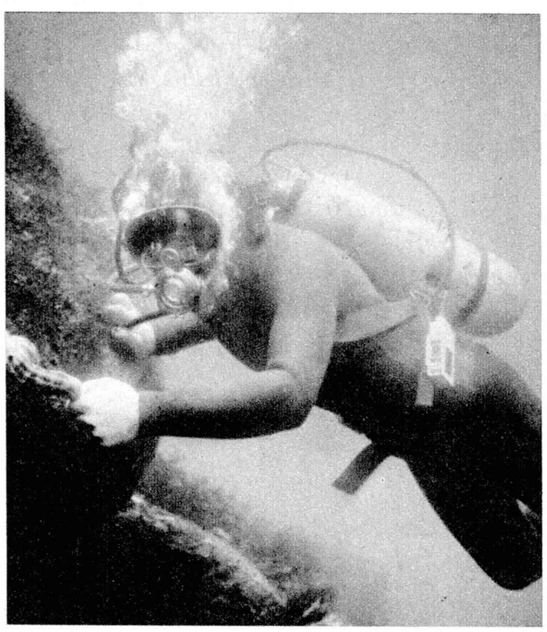
Widening Scope of Application for Supersonic Waves

New and practical appliances utilizing supersonic waves are appearing one after another, such as dishwashers for home use, "threadless" sewing machines, underwater telephones and apparatus to see through objects.

Relatively old in this field are dishwashers, which Japan has already exported. Recently, demands for these machines has started to grow again for use in washing syringes at hospitals and lenses at lens factories. Supersonic waves are used as a sort of motive power for plastic welder. When this apparatus gives supersonic wave vibration to two plastic sheets, one placed upon the other, the plastic heats and melts in an instant and the two sheets are welded together. A similar machine is the buttonhole sewing machine boasting five to eight times as high efficiency as conventional ones. It has thus come as a big boon to shirt makers.

The underwater telephone (photo) enabling conversation between divers in the water or between diver and person aboard ship is also an epochal device using ultrasonic waves for communication. A special microphone is attached to the throat of the diver. The vibration of the skin of the throat is changed into an electronic current of voice signals, which is transmitted by supersonic waves to the transmitting and receiving device of another diver. The new underwater telephone is effective up to a depth of about 100 meters and for a distance of up to about 600 meters between divers. Thus far, divers in the water have been sometimes stricken with terror because of extreme loneliness and unable to communicate with each other in case of emergency. And persons aboard ship have had no alternative but just to wait for a diver to come up to the surface. But the new underwater telephone enabling conversation in the water or with the surface is bound to greatly improve both the safety and work efficiency of divers.

Underwater supersonic wave telephones have also been developed in the United States. But their use is confined to military and other limited purposes because of the high price.



Japanese Currents

The Japanese-developed underwater telephone (maker: Shimada Physical & Chemical Industrial Co., Ltd.) is priced relatively low at ¥300,000 and is therefore, considered applicable to wide uses.

In addition, new supersonic wave apparatus with wide applicabilities have been developed with success, including an omni-directional fish detector capable of locating schools of fish not only right under a fishing vessel but within a radius of 2,000 meters, and an epochal device, which emits supersonic waves toward an object and then receives the reflected waves through acoustic lens to form an image of the inside of the object on the screen of a picture tube. The latter apparatus can, for instance, be used to examine and unborn child in the womb and internal organs in motion.

CHILDREN

Astronomical Boom among Youngsters

Three years ago, the discovery of the Ikeya-Seki Comet, considered the biggest of the present century, caused great excitement the world over, catapulting its Japanese finders—K. Ikeya and T. Seki—to international fame. And recently, it was reported that a 16-year-old American boy discovered another comet. In Japan today, there is a sort of "astronomical boom" among youngsters who are eager to find a comet themselves some day.

At present, Japan, along with Czechoslovakia, leads the world in the discovery of comets. When a new comet appeared late last April, six persons in various parts of the country simultaneously reported finding it. A widespread astronomical enthusiasm, clearly attested to by this example, has now permeated youth and even primary and junior high school pupils. Department stores have expanded their telescope counters, while beginners' magazines for observation of celestial bodies are selling in growing numbers.

The discovery of a comet requires no difficult theory. You have only to scour the night sky with a telescope and find a hazy celestial body that is not recorded on the star chart. Both Ikeya and Seki are veteran stargazers with 10 years' experience. Some boys intent on astronomical observation may be motivated by eagerness for fame. But the two veterans say: "Any worldly desire will blunt your eyes seeking a new comet. When we scour the sky with a telescope, we must keep our minds entirely blank. You can't continue this even for a year unless you really love stars."

COMMUNICATION

New Telephone for Noisy Places

A new telephone for noisy places, developed by the Nippon Telegraph and Telephone Public Corporation, began to undergo practical tests on October 1 to cope with perennial complaints: "We can't talk over public telephones at noisy places like subway stations."

The transmitter section of the new telephone is equipped with a special microphone and amplifier to enlarge the voice of the speaker while intercepting noise around him. In addition, another amplifier for the voice of the other party is placed in the handle section between the transmitter and receiver. The new telephone makes it possible to talk and listen with ease even at the Ginza 4-chome Intersection, noted for the heaviest motor traffic in Tokyo, where 80 phons is registered. It also enables telephone conversation in 90 phons, (registered, for instance, at a subway station when a train arrives or leaves), which

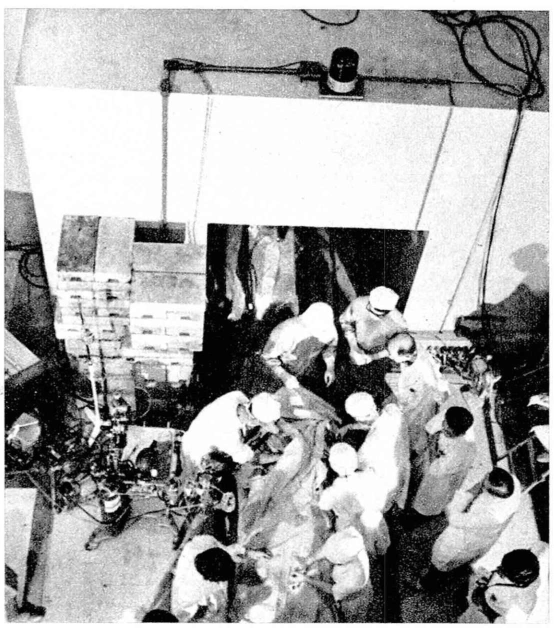


drowns out the voice in the case of present telephone.

The Nippon Telegraph and Telephone Public Corporation intends to place the new telephones at main national railway stations in Tokyo and emergency phones in the tunnels of the Tomei (Tokyo-Nagoya) Expressway to undergo tests for one year. Photo: Noise-proof telephone (left) and ordinary telephone (right).

MEDICINE

World's First Success in N-Reactor Therapy for Brain Tumor



Japan's first attempt to cure a brain tumor by means of a nuclear reactor has proved a complete success. And this success—the first in the world—has brightened prospects for the treatment of such tumors, called the "disease of death."

The patient involved is a 29-year-old woman, who developed a brain tumor named "spongioblastoma" in the right side of her brain in March last year. This tumor not only accounts for as much as 25 per cent of brain tumor cases, but also is so malignant that death comes within a year and half at most under conventional methods of treatment.

Prof. Keiji Sano and his Assistant Hiroshi Hatanaka of Tokyo University's Neurosurgery Department, charged with treating the woman patient, decided to apply a new therapy employing a nuclear reactor to bombard the tumor with neutrons. This method is characterized by the use of a certain kind of boric compound, which is absorbed well only by brain tumor cells. When irradiated with neutrons, the compound emits alpha rays capable of destroying tumor cells. The medical team of Tokyo University injected two grams of the boric compound into the patient's artery. A nuclear reactor was picked as the source of neutrons, and on August 20 this year, the patient was subjected to irradiation at a research reactor of the Tokyo Atomic Industry Research Institute in Kawasaki for 10 hours and a half.

This therapy, devised and developed in the United States, has so far been applied to 62 patients in that country. But every case turned out a failure, since a boric compound used spread to other parts of the patient's body and alpha rays destroyed normal cells as well. The success of the Japanese medical team is considered attributable to the use of a new boric compound (made by the Shionogi Pharmaceutical Co.), which is more preferentially absorbed by tumor cells alone than the American-made one.

The woman patient was discharged from Tokyo University Hospital on September 21 or about one month after the irradiation treatment and is now recuperating at the Metropolitan Hiroo Hospital. At the time of her discharge, Assistant Hatanaka announced: "The brain tumor the size of a fist rapidly shrank following irradiation. At present, it has vanished completely as far as an X-ray photo is concerned. The patient's weight, which dropped to 30 kilograms, has since increased to 39 kilograms. Her white corpuscle count rose to 13,000 for three weeks after the irradiation, but declined to a normal 7,900 after that. This indicates the neutron irradiation did not adversely affect normal tissues. The destroyed tumor has been discharged in the form of gray sediment mixed with cerebrospinal fluid via a polyethylene pipe inserted into the affected part of the brain."

"Whenever an opportunity presents itself," he added hopefully, "we want to use this new therapy from now on. In the future, we intend to develop a method of using new artificial elements emitting neutrons, such as californium, instead of the nuclear reactor to cure not only brain tumors but cancer in other

parts of the body." Photo: The patient is wheeled into the neutron irradiation room beside a nuclear reactor on August 20 to undergo treatment for a brain tumor.

PET

Canine Birth Control through Injection

A study on contraception for dogs by means of injections has been successfully completed by the Livestock Hygeine Service Center in Kyoto.

Under the new method, HESC, a sort of synthetic hormone, is injected into the dog's body. This chemical, usually employed to stimulate the growth of cattle and chickens, also has the effect of subduing the secretion of the estrogenic hormone from the pituitary gland, depending on the amount used. The service center has confirmed the proper amount through tests on nearly 200 dogs. It claims the method has so far proved 100 per cent effective with both dogs and bitches.

The effective period of this injection is five to seven months for adult dogs. After that, the secretion of the pituitary gland hormone returns to normal. It is both inexpensive and painless compared with the surgical contraceptive operation. It is thus likely to be a boon for urban areas harassed by stray dogs.

PUBLICATION

70 Years of Modern Japan in a Single Case

The Japan Times has the oldest history and the largest circulation of any English language newspaper in Japan. Recently, all of its issues spanning 70 years from March 22, 1897, when the first was published, to December 31, 1967 have been put on microfilms. The microfilmed Japan Times consisting of 180,000 frames in 450 reels is priced at ¥1,800,000 ($5,000) per set.

The history of modern Japan over the past 70 years is no doubt of keen interest to people in many parts of the world. Therefore, the complete microfilm of a newspaper reporting each on this country over all these years provides really valuable data for the students of



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JAPAN'S NAVY PLANES ATTACK HAWAII, SINGAPORE, DAVAO, WAKE, GUAM ISLES

Imperial Rescript

GREAT SUCCESSES REPORTED IN ALL AREAS RAIDED IN NAVAL ANNOUNCEMENT

the modern Orient and those interested in the history of modern Japan. This is particularly so considering the newspaper is printed in the English-language.

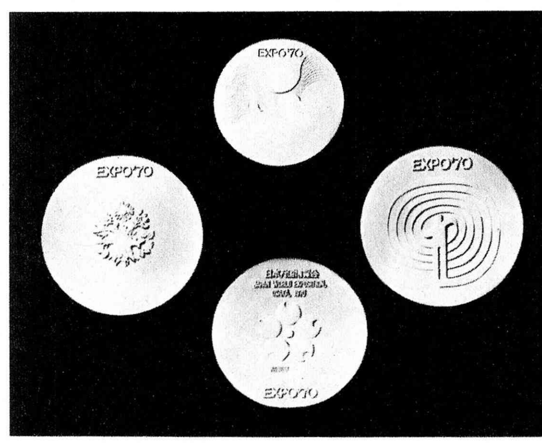
A pamphlet explaining the contents and other details of the microfilm may be obtained by writing to Yushodo Booksellers Ltd. (29, Yotsuya Sanei-cho, Shinjuku-ku, Tokyo, Japan). Photo shows Page 1 on December 8, 1941 reporting the outbreak of the Pacific War.

EXPO '70

EXPO '70 Mood Mounting

Preparations for the Japan World Exposition, Osaka, 1970 (EXPO'70) are making rapid progress. The number of participating countries has exceeded 45, while construction work on more than 10 pavilions has already got under way at the fair site in the Senri Hills in the suburbs of Osaka. Amid a rising mood for EXPO '70, the design of commemorative medals has been announced, while EXPO '70 admission tickets went on sale from October 31.

Commemorative medals consist of three types—namely, gold medal (18 carats, 2.7 centimeters in diameter), silver medal (3.4 centimeters) and bronze medal (3.4 centimeters). The faces of the three medals have the same design—that is, EXPO '70's symbol mark representing a five-petaled cherry blossom. As for the reverse side, the gold medal has an abstract design of "flowing clouds" signifying the progress of mankind and a feeling of space. The design of the silver medal represents a "tree bearing fruit"—a symbol of the harmony of mankind and the prosperity of the earth. The bronze medal has a design of a "man with outstretched arms" symbolizing the progress of the 20th century embraced by both arms and a wish for peaceful society. A set of the three medals is priced at 15,000 yen. Individual price is 1,500 yen for silver and 350 yen for bronze. But the gold medal will not be sold separately. The commemorative medals will be put on sale from September 15 next year or six months before the start of EXPO '70. Photo shows reverse side of gold (top), silver (left), and bronze (right) and face (bottom).



The admission ticket, meanwhile, costs 800 yen for adult and 400 yen for child. The ticket, measuring 7 centimeters long and 21 centimeters broad, has been designed by a group with Kohei Sugiura as art director. Of 10 colors used in printing, orange is the keynote color. Innumerable fine lines symbolizing the "current of history" run broadwise. In the center, these lines twine together to form a "flickering flame" symbolizing EXPO '70. Watermarked in this flame is EXPO '70's symbol mark. (Below photo).



THE VITALITY OF OSAKA

Photos by SEIRYU INOUE



"Osaka merchants" are reputed for their skill in commercial activities.

One never fails to enjoy Osaka's unique atmosphere—brisk commercial activity, affable merchants, fine, inexpensive foods and so forth .....

ENOUGH has already been said and written about Tokyo as the largest city in the world. By contrast, surprisingly little is known abroad about Osaka, Japan's second biggest city.

To be sure, Tokyo has been the capital of modern Japan since the Meiji Restoration in 1868. It was severely damaged twice in modern times—by the Great Kanto Earthquake of 1923 and by the American air raids during World War II. After both occasion, however, it rose from the ashes like the phoenix, and has now grown to be a modern city with the largest population in the world. Tokyo's development and advance must indeed be one of the wonders in the world. Nevertheless, the present-day Tokyo can present little in the way of traditional Japan. In this Metropolis, everything is international. Tokyo is now simply a big international province.

Osaka contrasts sharply with Tokyo in every respect. A three hours and 10 minutes' ride from Tokyo by the 200-kilometer-per-hour superexpress of the New Tokaido Trunk Line, it is a vast commercial and industrial city with a population of 3,100,000, situated at about the center of Japan and facing the Seto Inland Sea.

Looking back on its history, Osaka is older than Nara and Kyoto, both typical ancient capital cities. Osaka is thus Japan's oldest city with more than 1,300 years of checkered history since it was designated as the Imperial capital in 651 A.D. The status of Imperial city later shifted to Nara and Kyoto. Yet Osaka continued to thrive as a port of entry for continental culture, which came to Japan from the Asian continent by way of the Korean peninsula and the Seto Inland Sea. In this way, geographical advantage has always formed the basis for Osaka's prosperity.

This traditional superiority was brought into full play when Japan went through its modern industrial revolution in the Meiji Era. As a result, Osaka has become a center of industrial and economic activities in western Japan as contrasted with Tokyo, the political center in eastern part of the country. But in spite of such an old history, Osaka has few historic relics reminiscent of its past. Without being sentimentally wedded to old, traditional things alone, Osaka has always renewed itself to meet the needs of the changing times, achieving constant growth and evolution with great vitality. It is a "town living in the present" without vestiges of history.

At the moment, Osaka is in the midst of face lifting in preparation for the Japan World Exposition, Osaka, 1970, to be held in the suburban Senri Hills. Many waterways crisscrossing the city, once called the "metropolis of water," are being filled in one after another, while bridges are being replaced with new, higher ones.

DESPITE such a change in the outer appearance of the city, one thing that has remaind the same from olden times. This is the Osaka people—that is, the people who have firmly inherited the spirit of Osaka from their forebears.

It is well known that Osaka merchants, when greeting each other, say: *"Dodasu, Mokarimakka"* (How's everything? Are you making a profit?). These words of greeting, eloquent characteristic of the Osaka people, derive from the thoroughly realistic spirit of merchants for whom "making a profit" is a life-and-death problem.

It is *tonya* (wholesalers) who play a primary role in the commercial activities of Osaka. And wholesalers have gathered and formed special districts according to the commodities they deal in. This is another characteristic of the city.

In olden times, Osaka merchants not only collected and distributed commodities in nearby regions, which could be reached by land, but also traded with foreign countries. This overseas trade developed Osaka into a major trading center accounting for half of Japan's total foreign trade. The trading activities of Osaka are marked by the import of raw materials and the export of processed goods with the sales of textile and sundry goods to Asian nations as the pillars.

Sumitomo, one of Japan's prewar *zaibatsu* (financial combines), and the Matsushita Electric Industrial Co., the world-renowned light electric machinery maker, were born from among Osaka's numerous smaller enterprises, both commercial and industrial. In recent years, many Osaka firms have established their footholds in the economic circle of Tokyo in quick succession—all of them with success. But not a single Tokyo firm has ever scored such success in Osaka. This is eloquent proof that as Tokyo is a city of government, its people are no match for Osaka folk when it comes to commercial transactions.

WHEN you walk the streets of Osaka, you notice large numbers of eating places. Moreover, they are not smug, imposing restaurants, but places where the general public can enjoy eating in a relaxed atmosphere. In Osaka, there are as many as 13,000 such eating houses, ranging from small, specialized houses, which it appears have been bent upon improving the taste of particular foods for years, to a nine-story mammoth building where people can eat sample foods of any place in the world with every floor plus basement filled with variegated eating houses.

There is an old saying in Japan: *"Kyo no kidaore, Osaka no kuidaore"* (The people of Kyoto like to buy and wear fine clothes so much that they even go bankrupt, while the people of Osaka spend so much in eating delicious foods that they also go bankrupt). The Osaka people truly enjoy eating. And Osaka is surrounded by the producing centers of good foods, such as the Seto Inland Sea noted for fresh fish, Kobe famous for superb beef, suburban areas turning out various vegetables, and the Nada region, the mecca of Japanese *sake*. *Kuidaore* (going bankrupt due to extravagance in food) is indeed a happy expression for the Osaka people's traditional way of enjoying life.

"Even if you eat your fill of extravagant foods, there is a limit to the capacity of your stomach, isn't there? Let's make much money and eat delicious foods to our hearts' content. This gives you adequate energy for tomorrow's activities. But clothing doesn't make such contribution, does it?" This is how the Osaka people philosophize about their enthusiasm for food. The Osaka people have also elevated foods to the level of works of culinary art. First-rate restaurants, such as Kitcho and Nadaman, do not serve these who have no special introduction of qualified persons. They even serve food on ancient dishes and plates, which are regarded as important works of art.

In a word, Osaka is not a showy place. When you visit Kyoto to take a first-hand look at Japan's good old days, don't forget to go to Osaka only 30 minutes' drive from Kyoto and observe its throbbing vitality of the masses who live in the present.

Unfortunately, Osaka itself is not richly endowed with beautiful scenery—the standard attractions for tourists. But in walking along its streets, one never fails to enjoy Osaka's unique atmosphere—brisk commercial activity, affable merchants, fine, inexpensive foods and so forth.

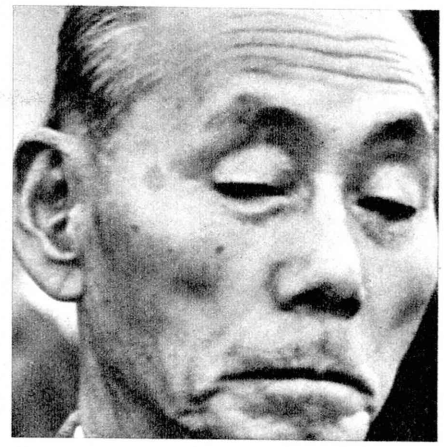
Osaka people are friendly and kind. Just ask one of them: "Excuse me, but could you direct me to the subway station?" He will show you the way and then say: *"Kiotsukete Yukinahare"* (Please be careful).

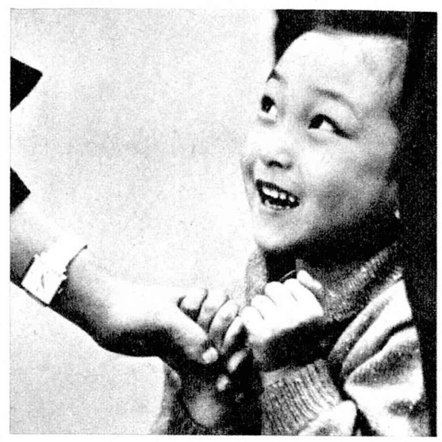




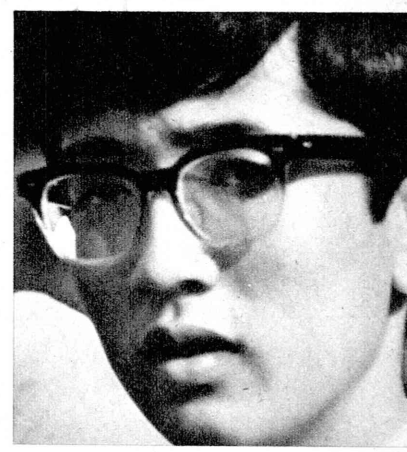










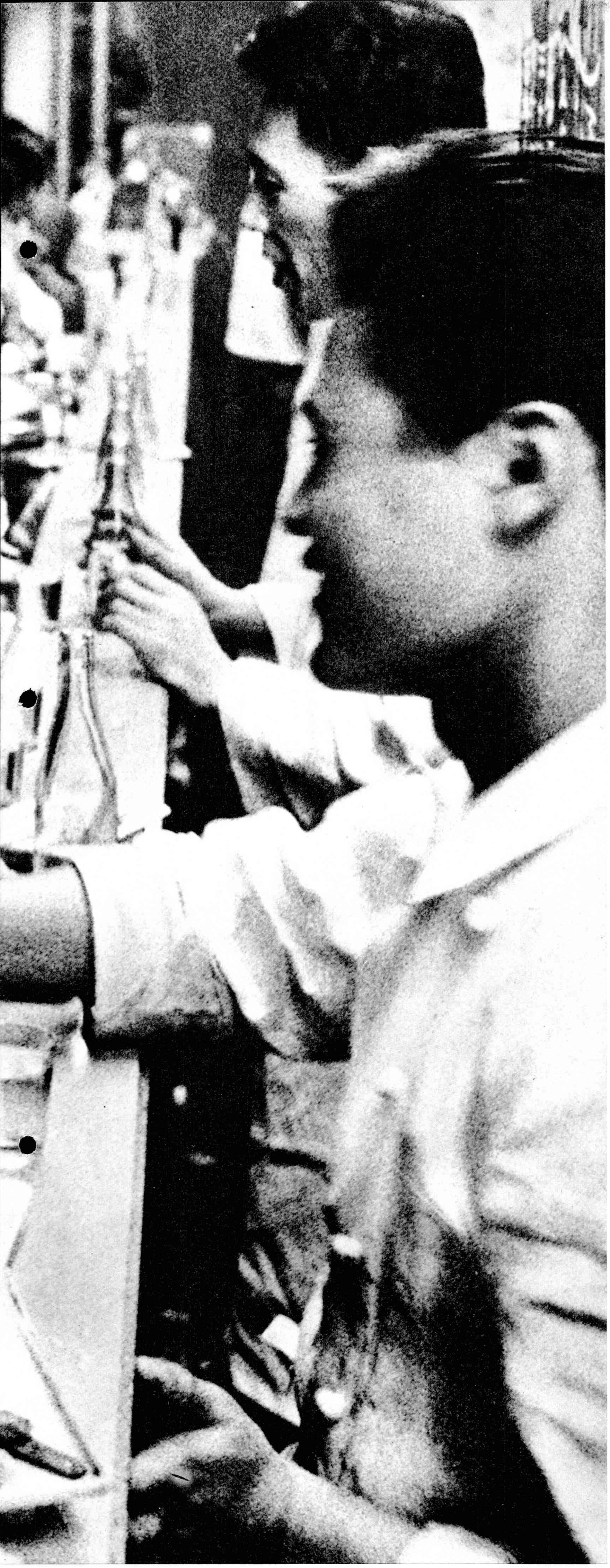


Left: "Tsuten-kaku," rising 103 meters high above the ground, is a tower symbolizing the commercial city of Osaka. The vicinity of this tower is a popular amusement center called Shin-Sekai (New World), with movie theaters, amusement halls, chophouses, etc. closely standing side by side. Right: Restaurant in downtown Osaka, specializing in crab dishes. A giant crab-shaped signboard promptly draws attention. A really down-to-earth, frank publicity of Osaka style.

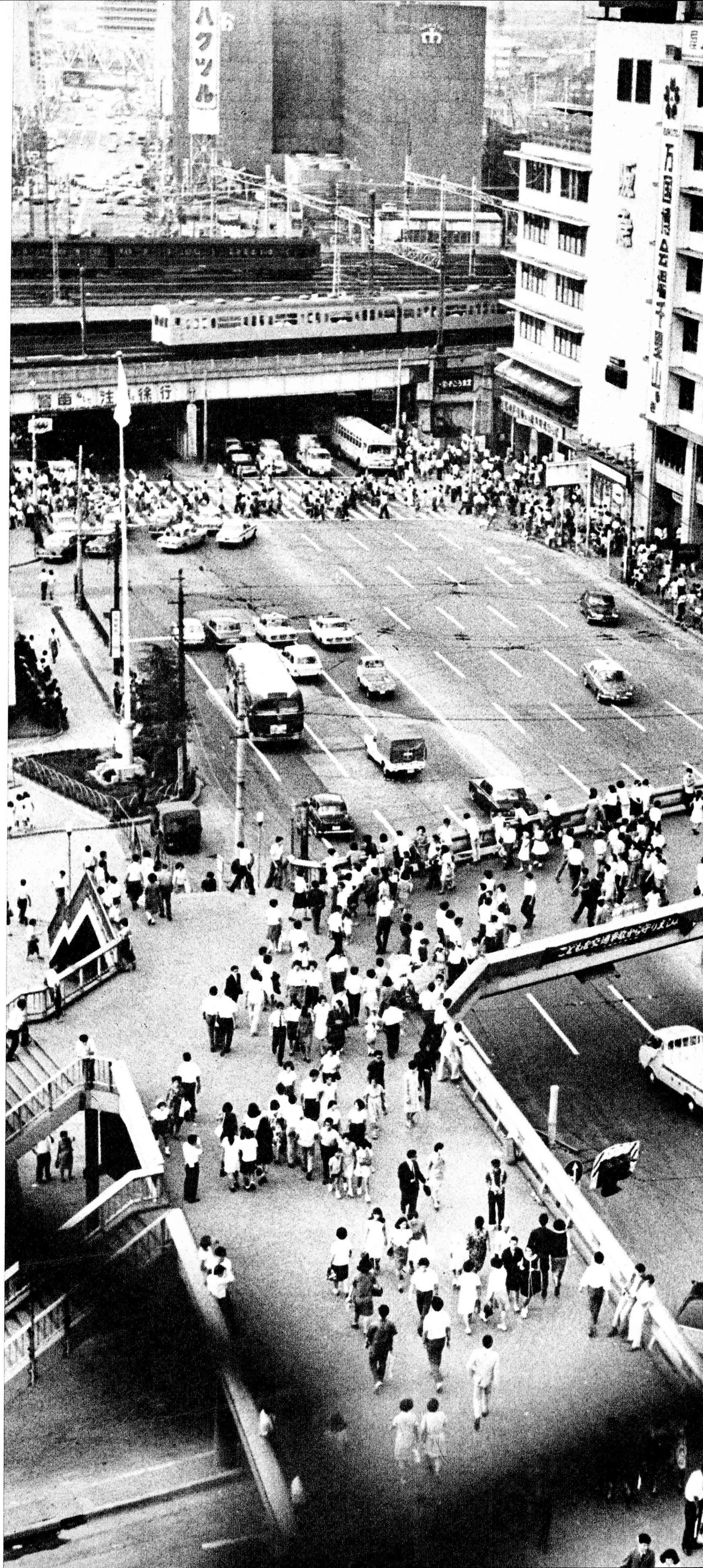




After a day's work, Osaka citizens, perched along a counter, enjoy a drink or two. Right: In a mammoth and popular restaurant, dishes flow on a specially installed conveyor.

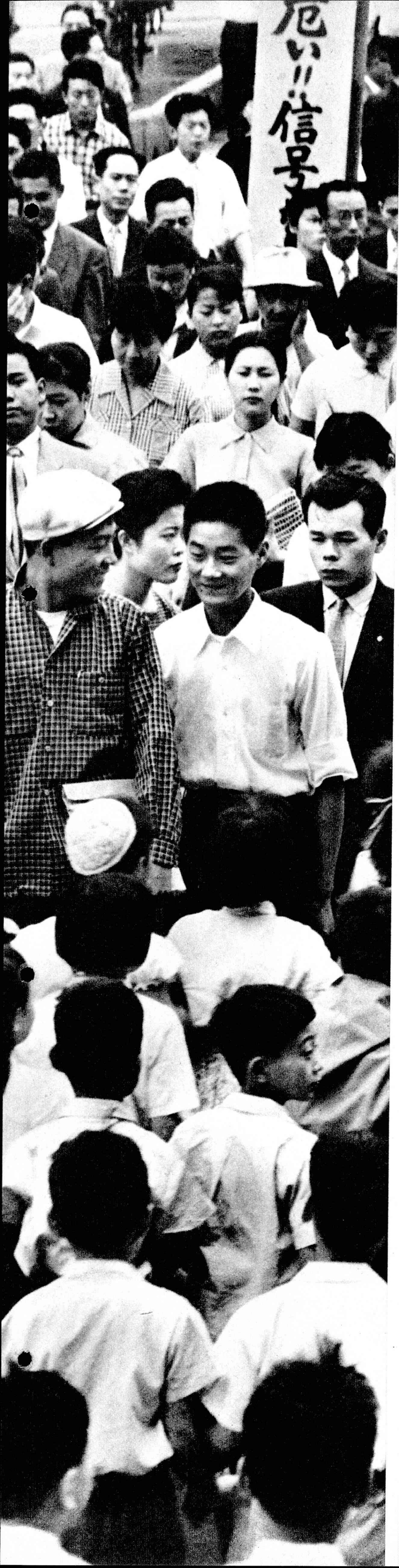






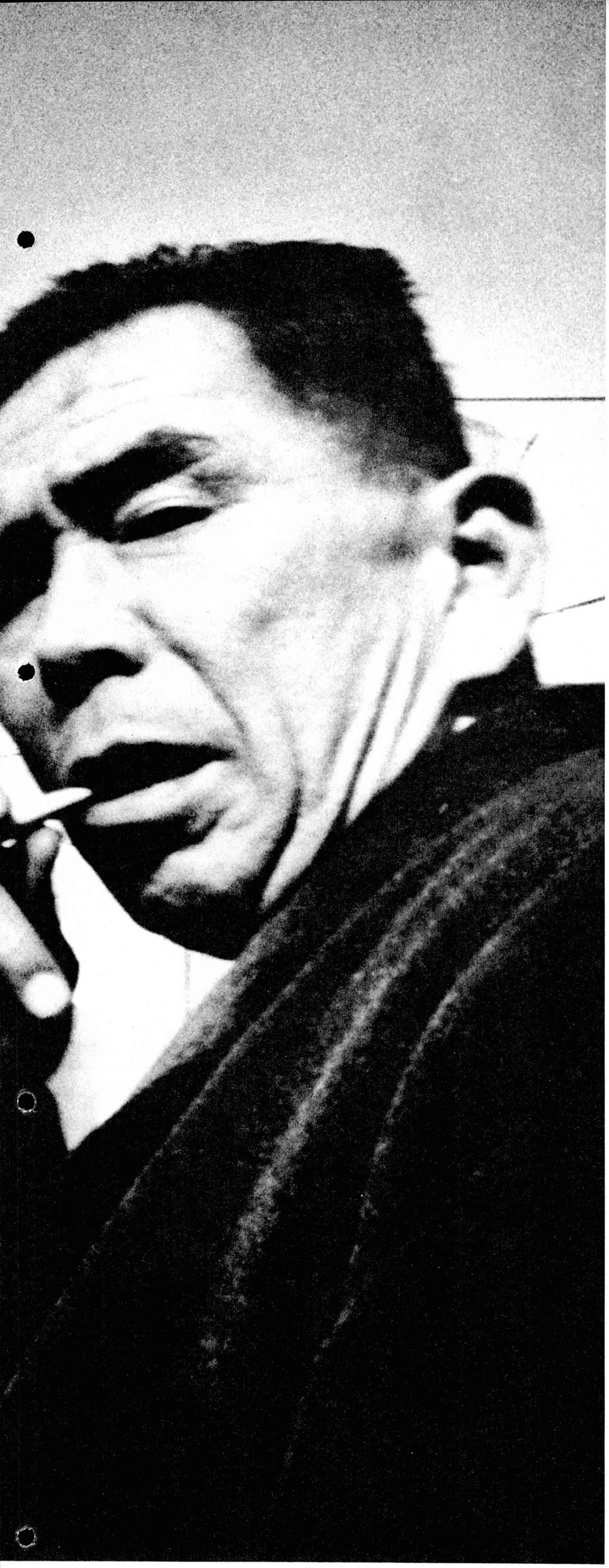


Osaka citizens are hard-working, energetic people. They turn out in great force to work and to play. Both streets and public conveyance systems are already packed to overflowing.


危い!!信号




阪急
HANKYU
塚ファミリーランド



"Hi there, are you making money?"

Old wholesale shops remain along the back streets of the business center, and old business practices are still preserved.





Nearly 30 per cent of the stores in Osaka are traditional wholesalers, who form their own blocks each specializing in a certain kind of goods.

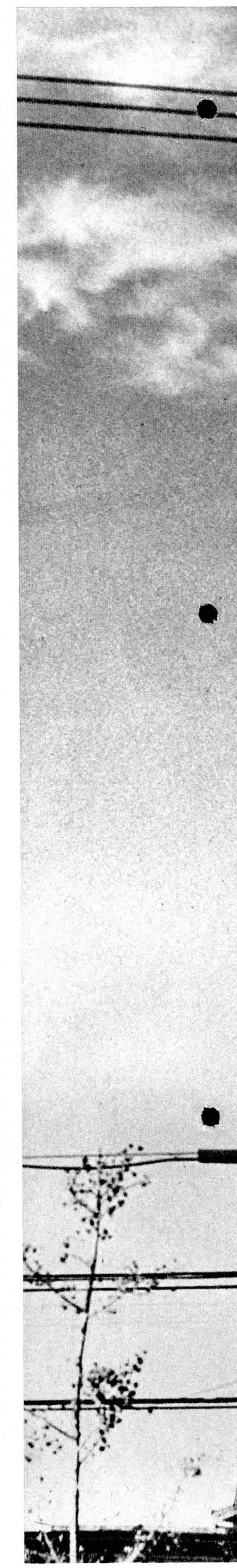


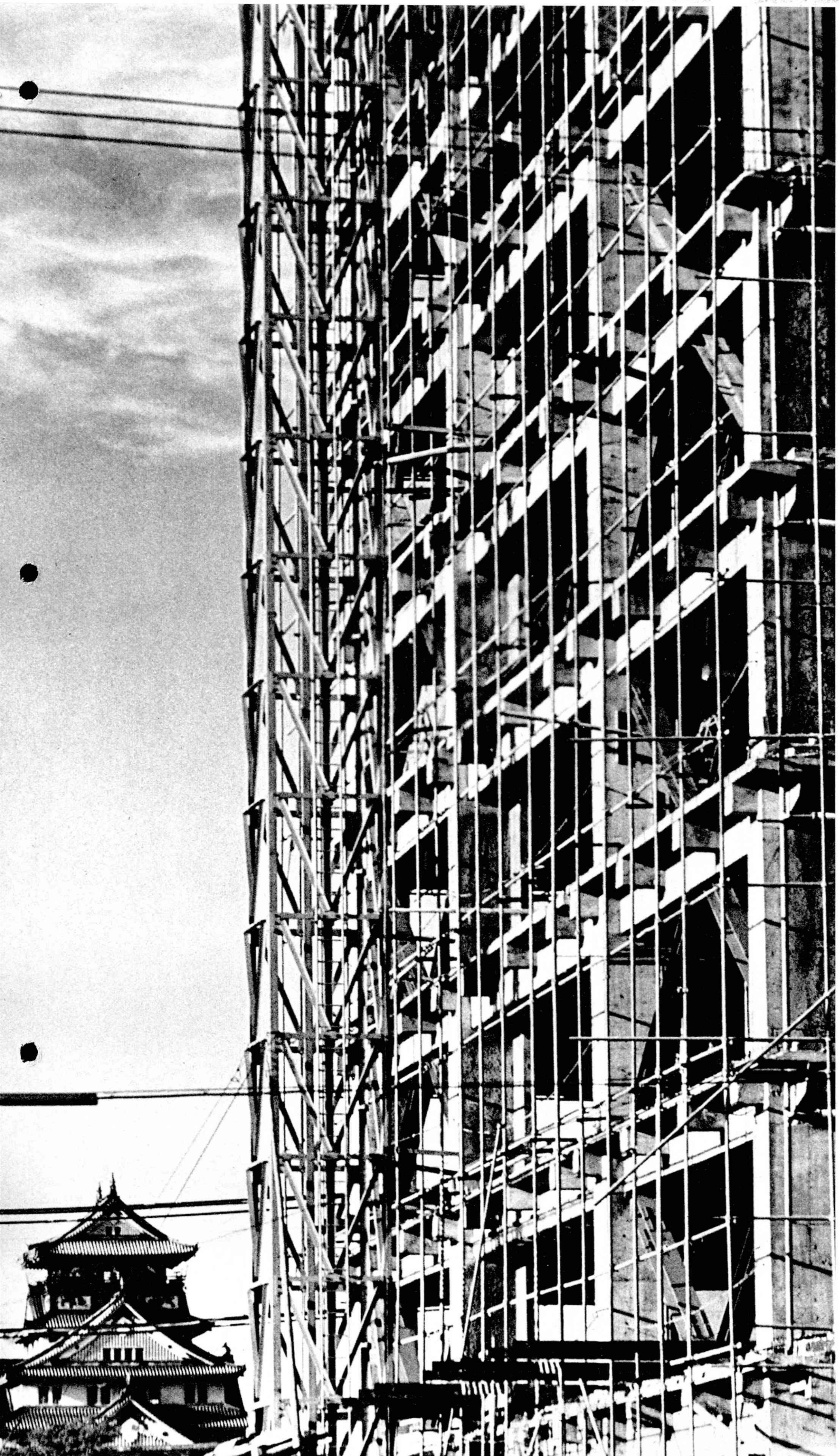
Osaka is an overly congested city. Roads are crowded with diverse vehicles. As long as the phenomena of excessive congestion prevail the city will continue to undergo constant changes, which will give birth to new structures.



There is not a single let-up in the expansion and metamorphosis of Osaka.







Above: The Osaka Castle, a symbolic landmark of the city, now sinks in a sea of skyscrapers. Left: Known as a "Metropolis of Water," Osaka is crisscrossed by the Yodo River and numerous man-made waterways.

"Earn well and play well" is the policy of Osaka people.







OSAKA GUIDE

REGULAR SIGHTSEEING BUS TOURS

There are day and night bus tours operated by the JTB daily throughout the year. Foreign tourists will enjoy the places of interests in the most effective way by these tours, accompanied by English-speaking guides. Pick-up services are made at major hotels in the downtown Osaka.



Osaka Castle (Photo by JNTO)

Afternoon Tour

1:00 p.m. – 4:30 p.m. US$4.20 (¥1,500)

OSAKA CASTLE
The most conspicuous landmark in Osaka. Originally built in 1583 by Toyotomi Hideyoshi where bird's-eye view of the city may be enjoyed.

SHINSAIBASHI SHOPPING STREET
The most bustling shopping center of the city, being lined with two department stores and a great number of refined specialty shops.

SHITENNOJI TEMPLE
The oldest Buddhist temple in Japan founded by Prince Shotoku in 593 A.D. The temple is noted for the stone Torii Gate at the front entrance.

Night Tour

7:00 p.m. – 10:45 p.m. US$11.20 (¥4,000)

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A huge theater-style cabaret staffed with its own producing and performing troupes. A series of lively shows ranging from naive Japanese folk dances to daring burlesque are staged. Refreshments will be served.

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CABARET KING
Another of the big cabaret featuring colorful towering indoor fountains and various floor shows. You may have your choice of a beverage.



Shitennoji Temple (Photo by JNTO)

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Osaka Royal Hotel Arcade	Tel. 448 1121

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SUSHI

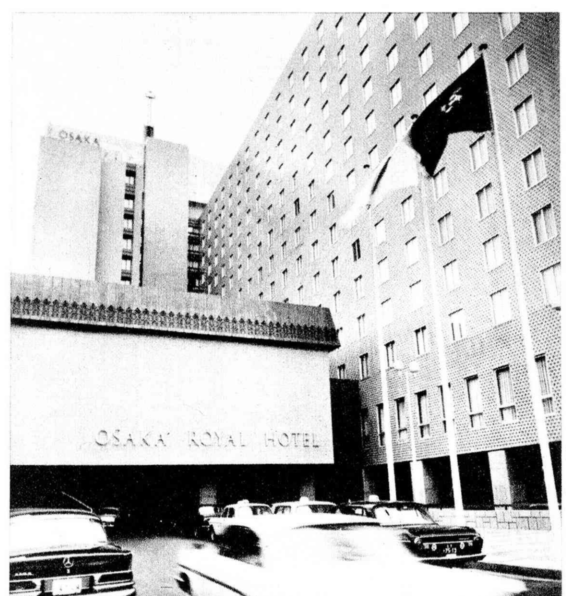
Nakata	
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Maiko Dance Show
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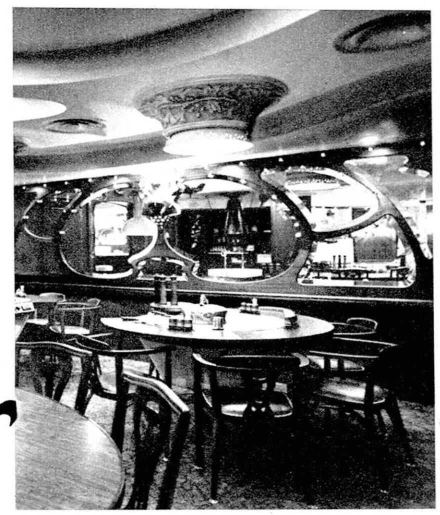


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The Lure of the Steam Locomotive

Photos and Text by NAOTAKA HIROTA

The "Kings of the land" are about to vanish completely after pulling economy and culture ahead for a century.



JUST now, there is a sort of "steam locomotive boom" in Japan. For instance, special trips are planned for fans to enjoy a ride in a train pulled by a steam engine, while phonograph records featuring their chugging sounds are selling like hot cakes. Even the newspapers carry serialized stories about them. It is not mere nostalgia for the vanishing steam locomotives that has given rise to such a phenomenon. But the people have now realized the wonderful services so far rendered by steam locomotives, which have been not only pulling passenger and freight trains but also promoting culture and economy in the nation's drive for modernization and progress. The following is a brief review of the steam locomotive's history in Japan plus profiles of the country's representative steam locomotives.

In the latter half of 1860's, the new Government of Meiji, which had replaced the Tokugawa Shogunate, abolished national isolation and set about adopting the culture of advanced nations with great vigor through interchanges with other countries.

Railroad equipment, along with telephone and photographic apparatus, was imported from Britain, and Japan's first railroad was opened between Shimbashi, Tokyo, and Yokohama in October 1872 over a distance of 29 kilometers. This came 47 years after George Stephenson operated the "Locomotion" between Stockton-on-Tees and Darlington, England. And it was also three years after the transcontinental railroad of the United States was completed.

In those days, railroad construction was under the guidance of British engineers. Therefore, locomotives and other things, to say nothing of construction materials, were of British make. When the first railroad was opened, Japan had 10 locomotives—that is, two tender engines and eight tank engines with 1–B axle arrangement. And since most of these locomotives were not those specifically designed for Japanese use, they were not necessarily suitable for local conditions. For instance, Engine No. 3, made in Yorkshire, had no covering around the engineer's cab, like those for the tropical areas and perhaps the designers believed that Japan is a tropical country. In winter, therefore, the engineer was directly exposed to snow.

Chosen, the Honorable Engine No. 1 was a small locomotive made by the Vulcan Foundry. It measured 23 tons in weight and 9.8 kg/cm^2 in working pressure. It is not known whether this was painted blue or green when it ran along Japan's first railroad. In any case, it proudly shuttled between Tokyo and Yokohama before numerous awe-stricken spectators. Passengers were required to be on the platform at least 20 minutes before the departure time of the train. After that, the gates of the stations were closed. Indeed, passengers of trains in those days were treated quite like those of today's jetliners. Later, however, Engine No. 1 gradually went under, finally reduced to the status of a shunting engine and locomotive for a private railway's feeder line. Yet it was eventually taken over by the Museum of Railway Traffic and designated as a Japanese railway monument.

JAPANESE railroads, initiated under British guidance, continued to make steady strides by introducing American and German techniques.

In 1893, Japanese technicians completed the first steam locomotive of domestic make after strenuous efforts, although Japan had not a single major steel mill as yet. This was a typical example of the determination of youth in the Meiji Era to create a new nation with their own hands. There is no gainsaying that the experience gained and the enthusiasm displayed in this pioneer work paved the way for the development of high performance locomotives C51 and C62. When the Tokaido Trunk Line, Japan's main railway line, was opened, 2–B tender engines for long-distance haulage made their spectacular debut to shuttle along the Pacific coast.

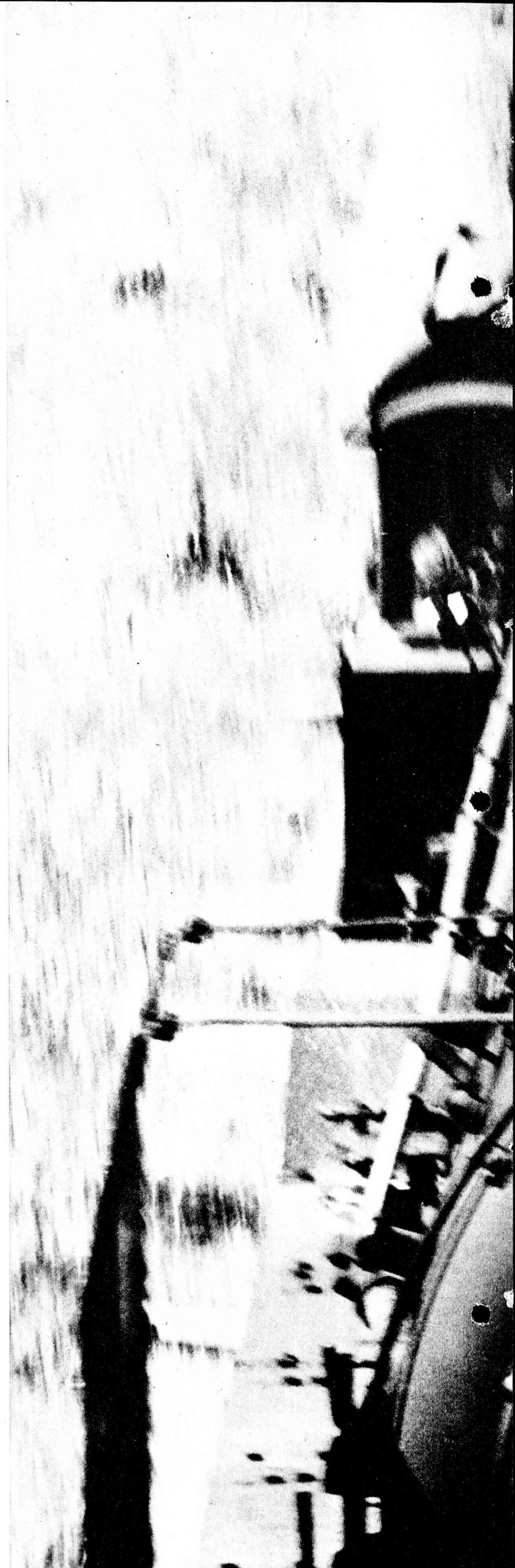
In the meantime, private railroads developed. In those areas where they ran parallel to national railways, an intense service competition unfolded. And the competition naturally gave added impetus to technological advance as had been the case with railroad rivalry on the route between London and Edinburgh in Britain. It was in those days when the locomotive Hayakaze with 5-foot, 2-inch driving wheels made its appearance.

With the advent of the Taisho Era (from 1912) after the first superheat-type steam locomotive 8850 and Mallet-type locomotive 8700 played an active part in the Japanese railroads, a mass production system for locomotives gradually took shape in this country.

The historic locomotive C51 was born in 1919. Japanese railroads have a narrow gauge of 1.067 meters. For a narrow-gauge locomotive, the C51 was an epochal design featuring big driving wheels with a diameter of 1.750 meters and an output of 1,000 horsepower. In particular, the large diameter of the driving wheels was not exceeded until the development of the C62. For a narrow-gauge railroad, this driving wheel ranked among the largest in the world. Born successively after that were the C53 with a three-cylinder engine and C59, boasting the greatest length. About this period was indeed the golden age of Japan's large-sized steam locomotives. And it was about this time that the limited express trains "Tsubame" and "Fuji" with observation cars made their debuts.

In 1948, two giant steam locomotives emerged—that is, the large tank engine E10 and Japan's largest and most powerful passenger train locomotive C62. This was highly welcomed by the public at a time when Japan was still in a state of confusion after the war. This E10 was the last new-type steam locomotive of the Japanese National Railways.

THIS year marks the 96th year since Japan's first railroad was opened between Tokyo and Yokohama. For about a century, Japanese steam locomotives have been pulling countless, variegated materials and persons.



Formerly, the Japanese National Railways had as many as about 330 models of steam locomotives in active service. Nevertheless, only 19 models remain at present as a result of the emergence of the New Tokaido Trunk Line, the electrification of trunk lines and the accelerated switchover of local lines to diesel cars. The national railways still have 2,000 locomotives, but many are motionless and



C62 coming along with its chugging sound.

exposed to the elements.

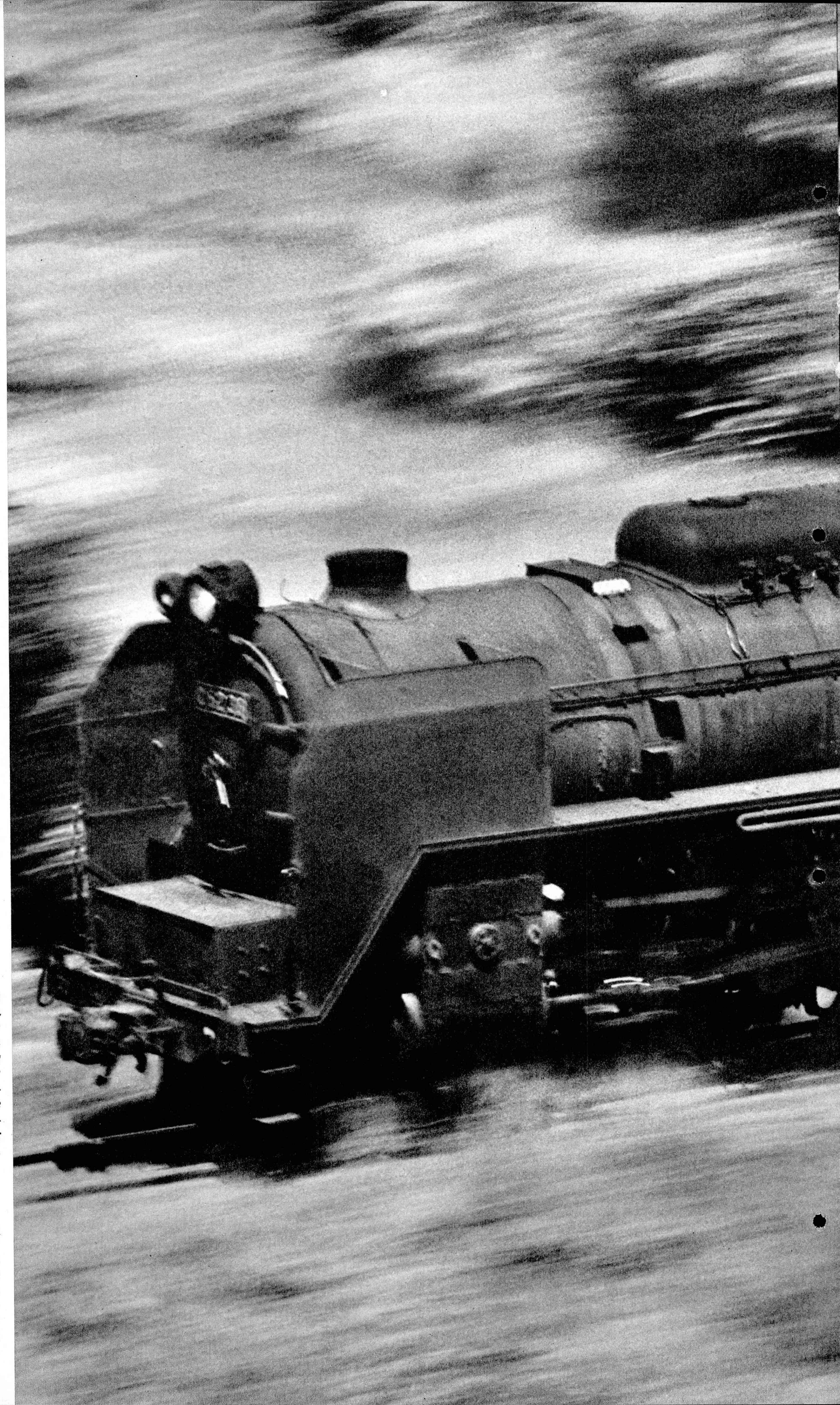
In five years' time, all steam locomotives are expected to be put out of commission. But now, an intriguing program is in the making. Under this program, steam locomotives will be preserved in an operative condition at a roundhouse of the Oyama Engine Section about 80 kilometers north of Tokyo. There, the engines will be fired up at intervals of several days to operate them on nearby sidetracks. Already, 11 models of locomotives have been chosen for preservation. At present, negotiations are under way to preserve another old locomotive, made by Robert Stephenson & Co. of Britain in 1873 and now kept by the Kaya Railway Co. in Japan.

The preservation of steam locomotives in this way is of great significance. Nonetheless, to put it figuratively, such locomotives are birds in a cage, and not birds flying freely in the sky. Although this cannot be called a real of life, I am hopeful that the "kings of the land," who have lived over a century, will teach something important to our children and grandchildren.

Incidentally, the steam locomotive has such strength and robustness to orientate a man's life. Out of eagerness to bring steam locomotives as close to myself as possible, I learned how to use a camera, and eventually ended up as a professional cameraman. My present dream is to publish for overseas locomotive fans a book of steam locomotive pictures which I have taken with the utmost devotion over the years.



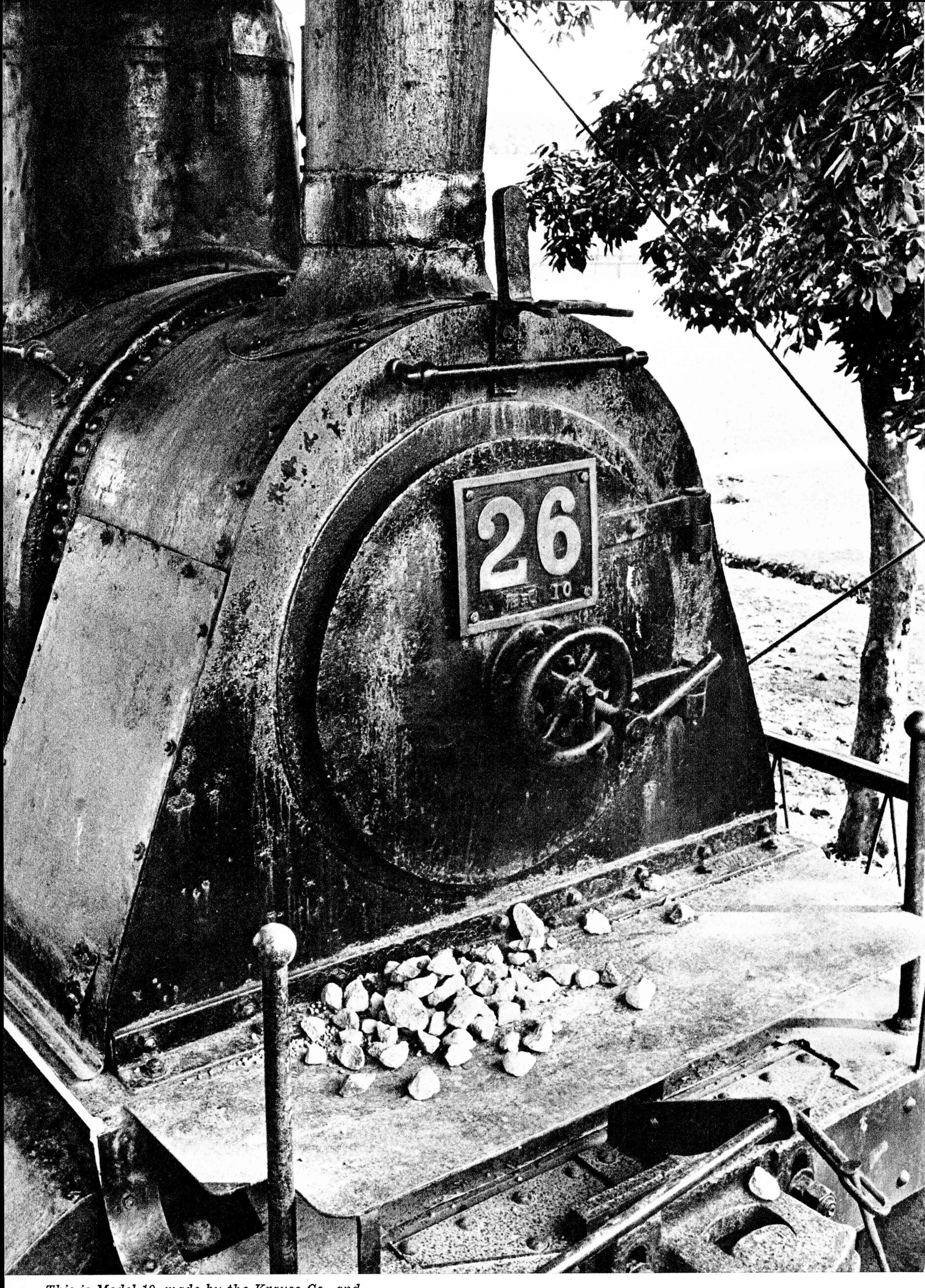




The C62 is Japan's largest and most powerful steam locomotive for passenger trains. Marked by a thick boiler and big driving wheels, it is a "glamor locomotive" with a maximum capacity permissible under mechanical limitations. Weight: 88.83 tons; total length: 21.475 meters.

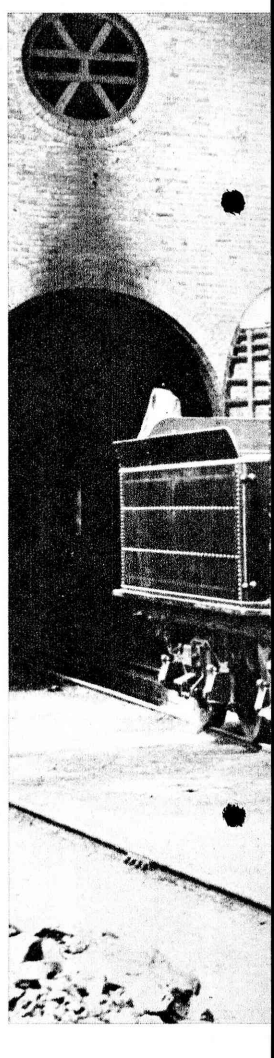
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A chilly wind blows up from the valley as a C11 tank engine passes an iron bridge. Autumn is ending in this valley, which seldom sees visitors except those passing through on the railway a few times a day.

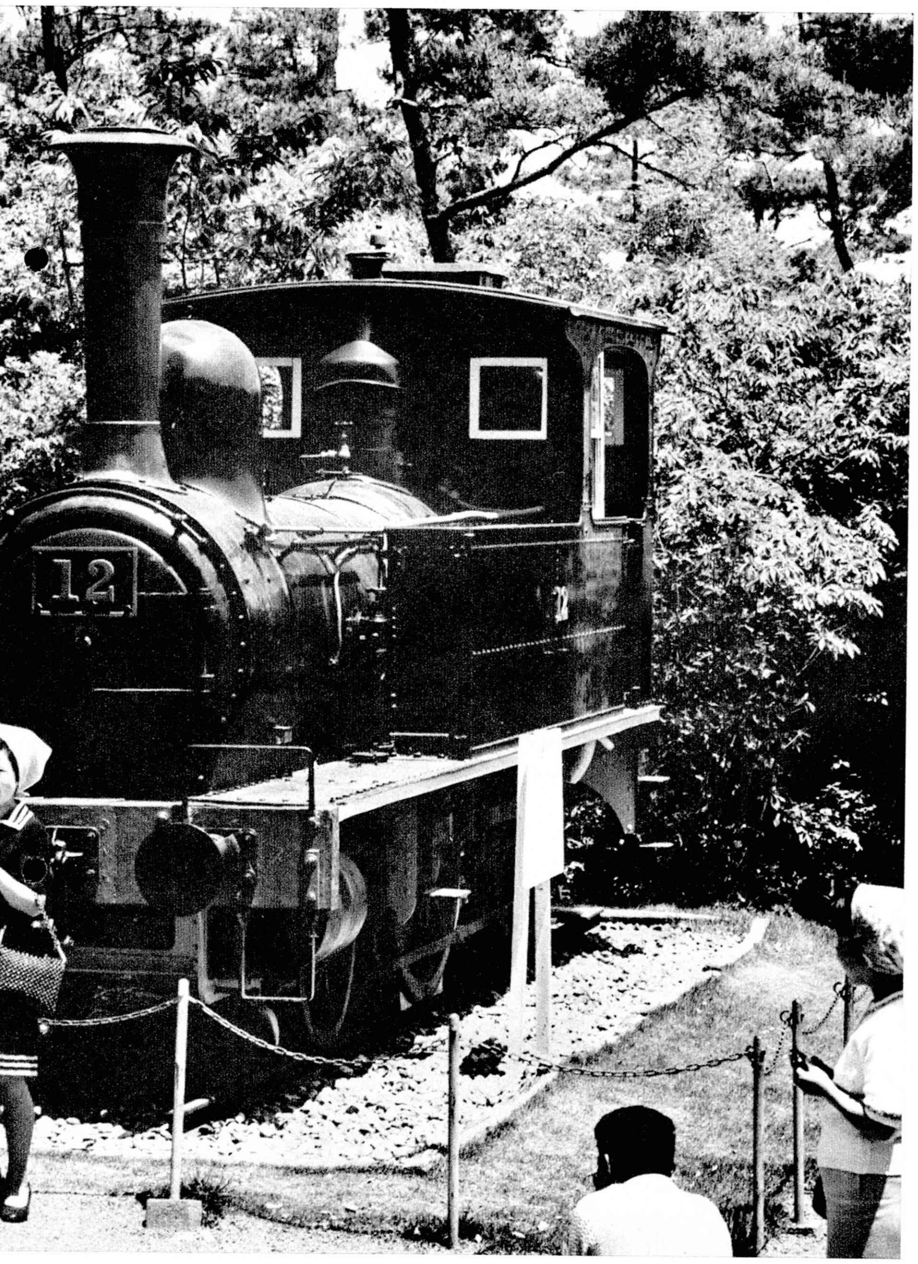

C62 38

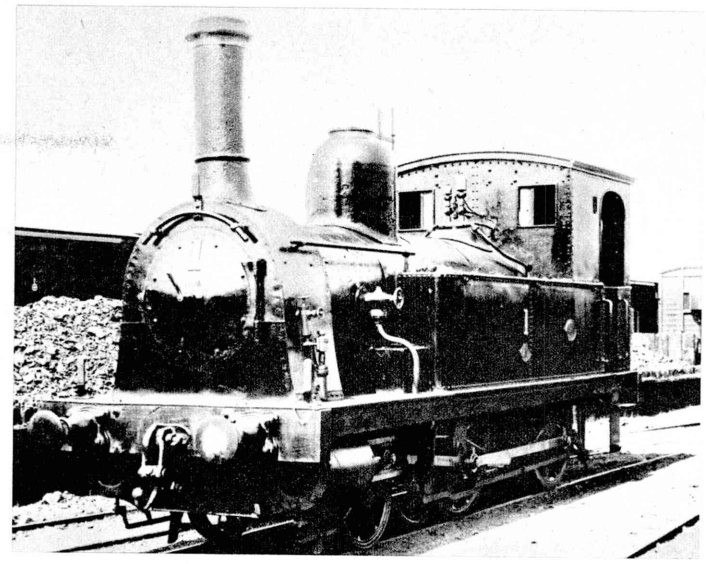


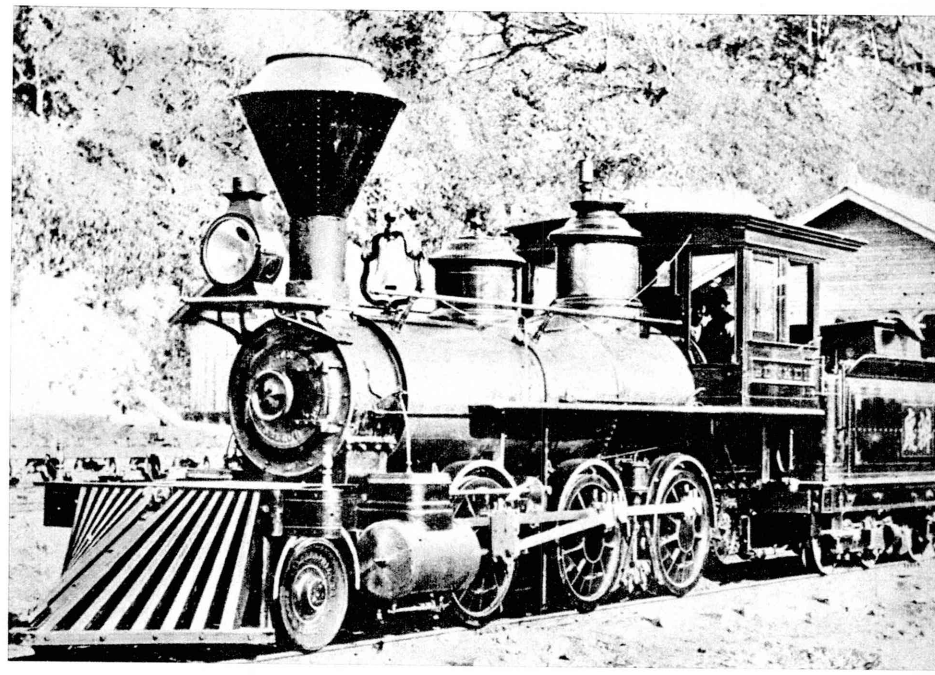
This is Model 10, made by the Krauss Co., and one of the first German steam locomotives to arrive in Japan. At present, the retired locomotive is preserved at a shrine. I saw pebbles piled up on its front part in just the same way as those stacked up on the "torii" (gate of a Shinto shrine) by worshippers.

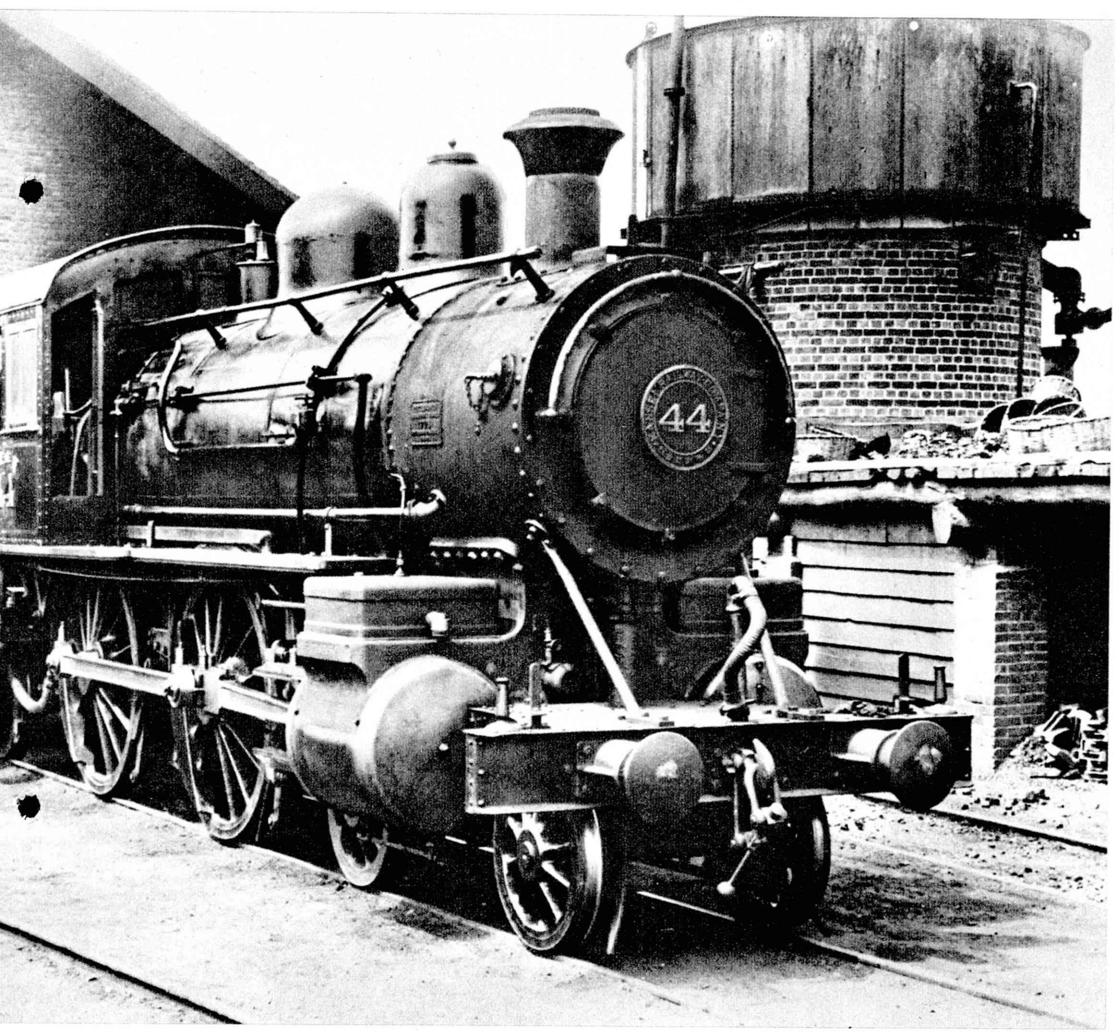




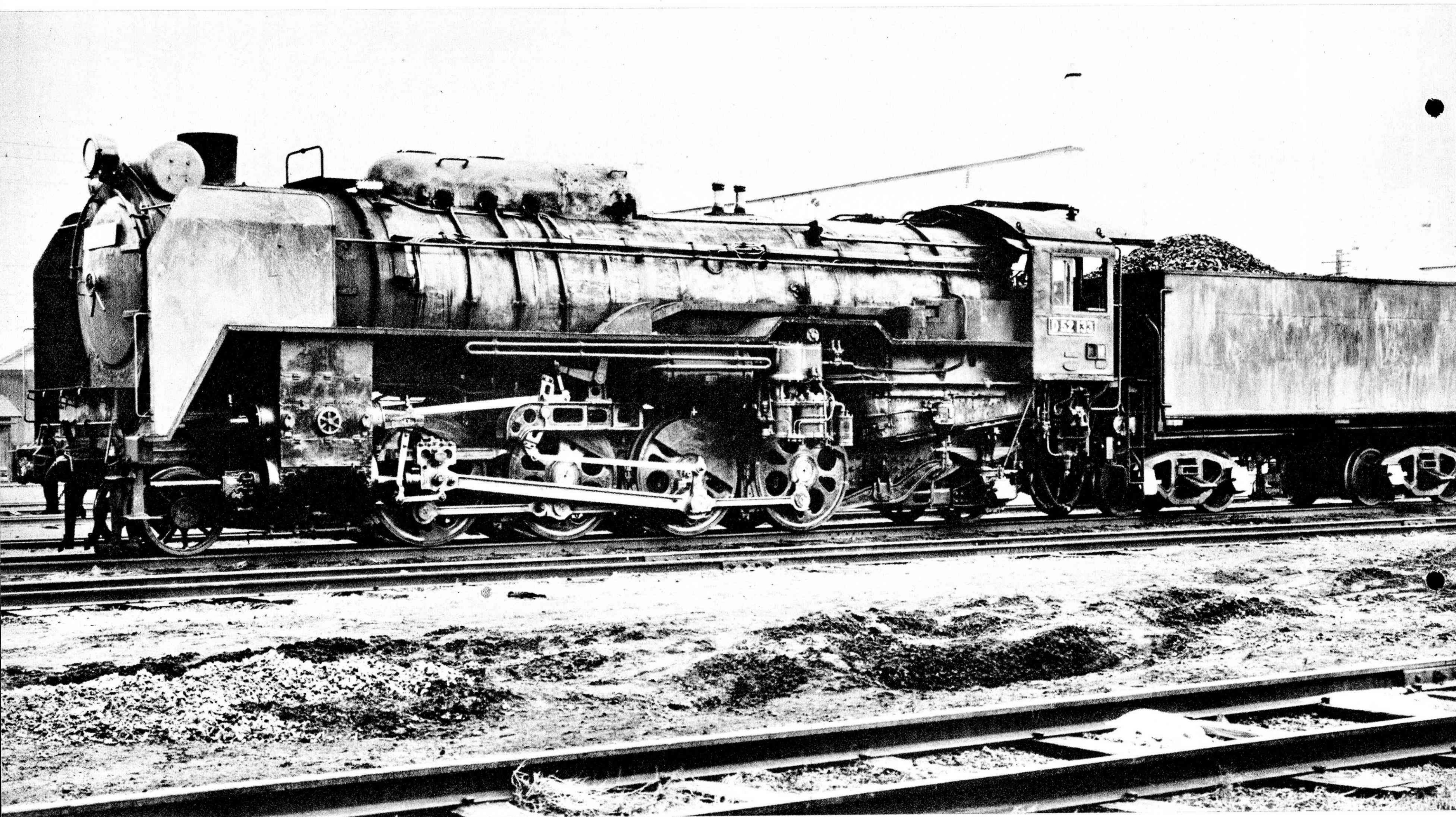






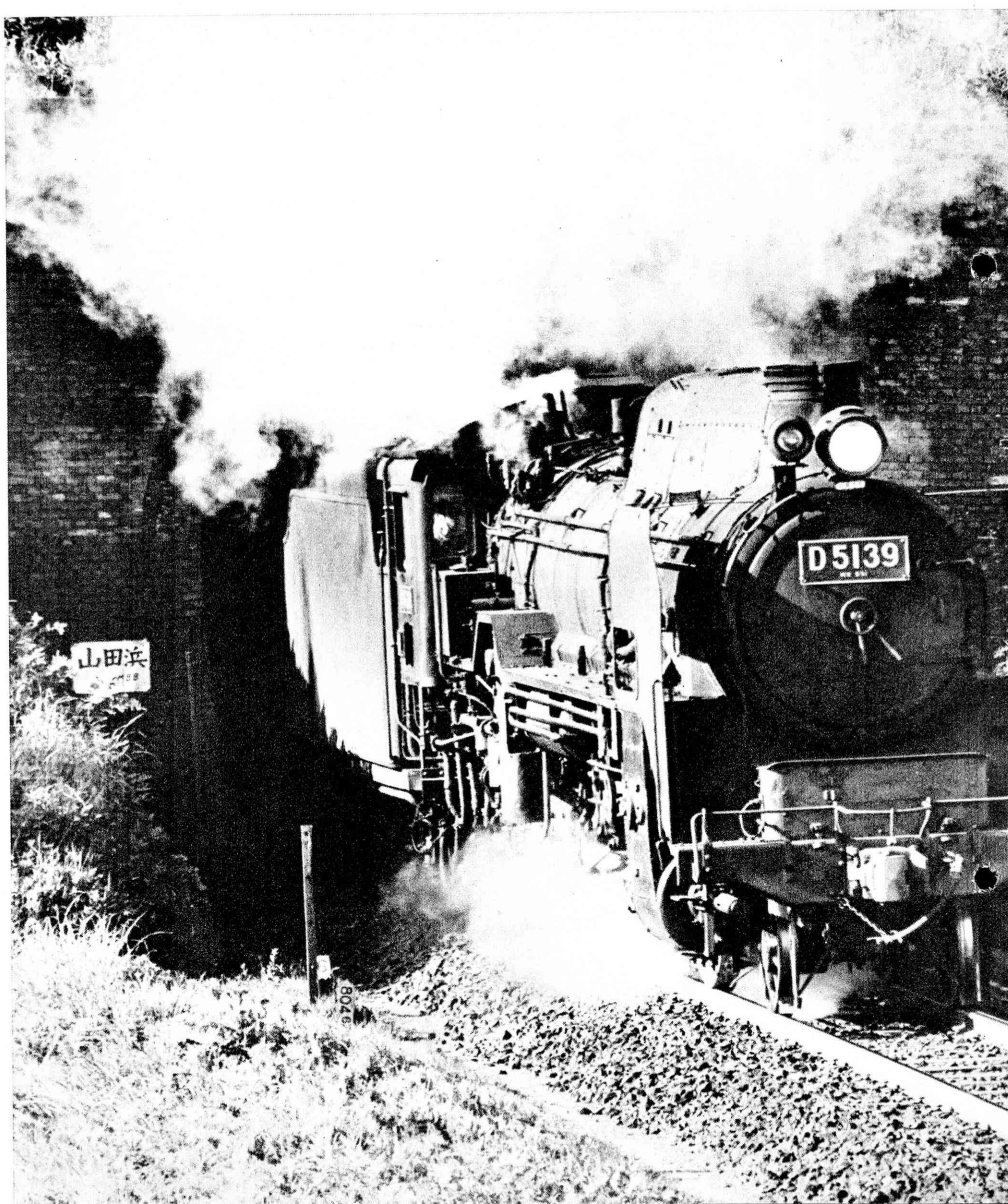


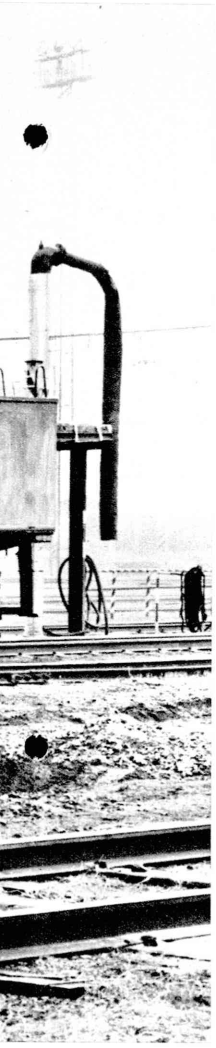
Above left: The weather was fine when I visited the Meiji Village (specially made to collect and preserve the relics of the Meiji Era). In front of an old locomotive, a young couple was posing for a souvenir picture. Left: MODEL 6500; Manufactured by Pittsburgh Steel of the United States in 1898. Named Hayakaze, it belonged to the Kansai Railway Co. Top: ENGINE NO. 1 Manufactured by the Vulcan Foundry of Britain in 1871. Bottom: BENKEI: The first locomotive imported from the United States. Manufactured by Porter in 1880. A total of eight locomotives of this model were imported. The others also were given historical Japanese names, such as Yoshitsune and Shizuka.





Top: D52. The largest and the most powerful goods engine in Japan. Weight: 85.13 tons; total length: 21.105 meters; diameter of driving wheel: 1.4 meters. A total of 285 D52 were produced. Bottom: Class 8620 passenger engine. Mass produced between 1914 and 1929. Weight: 48.83 tons; total length: 16.765 meters; diameter of driving wheel: 1.6 meters.



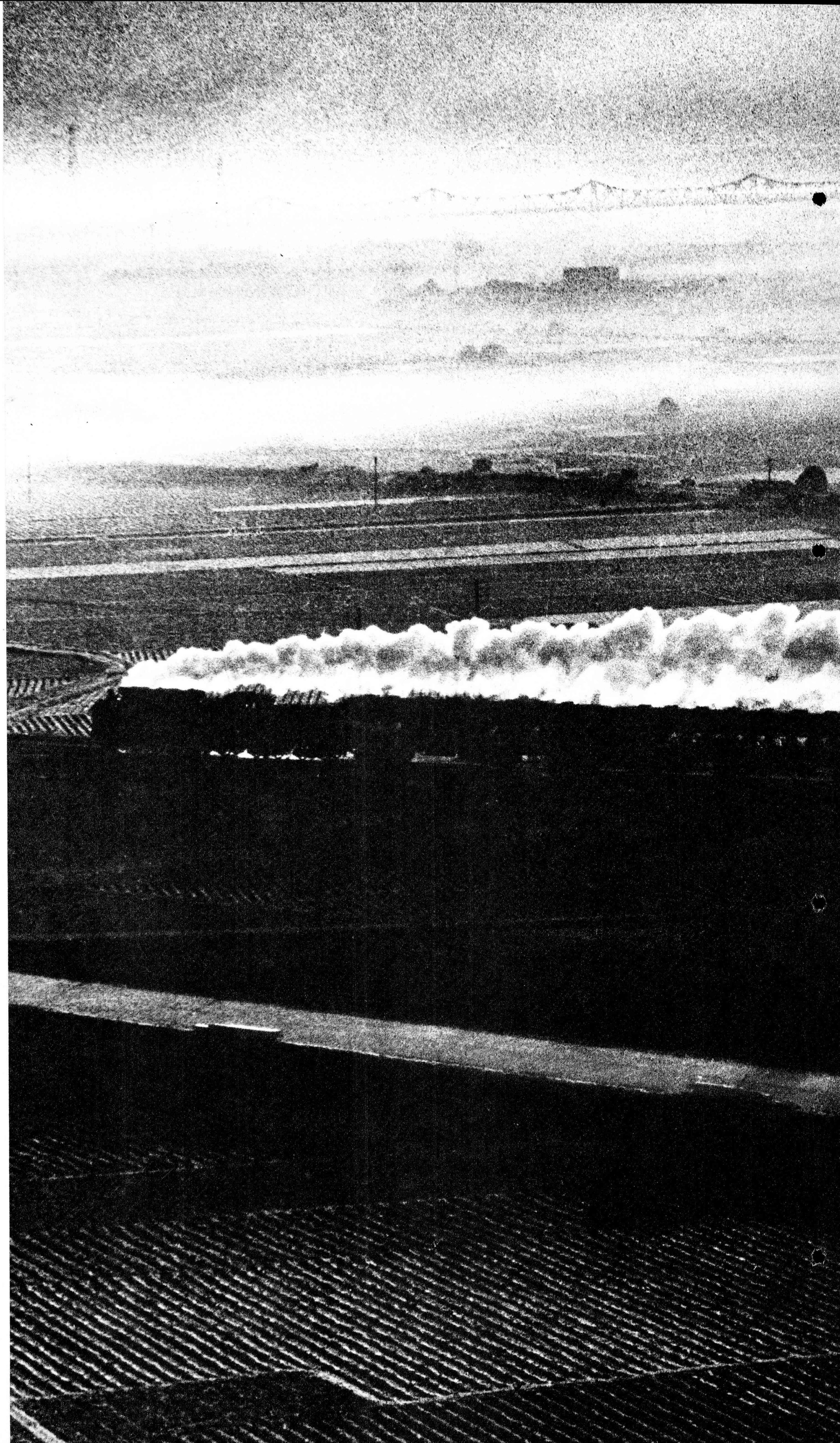




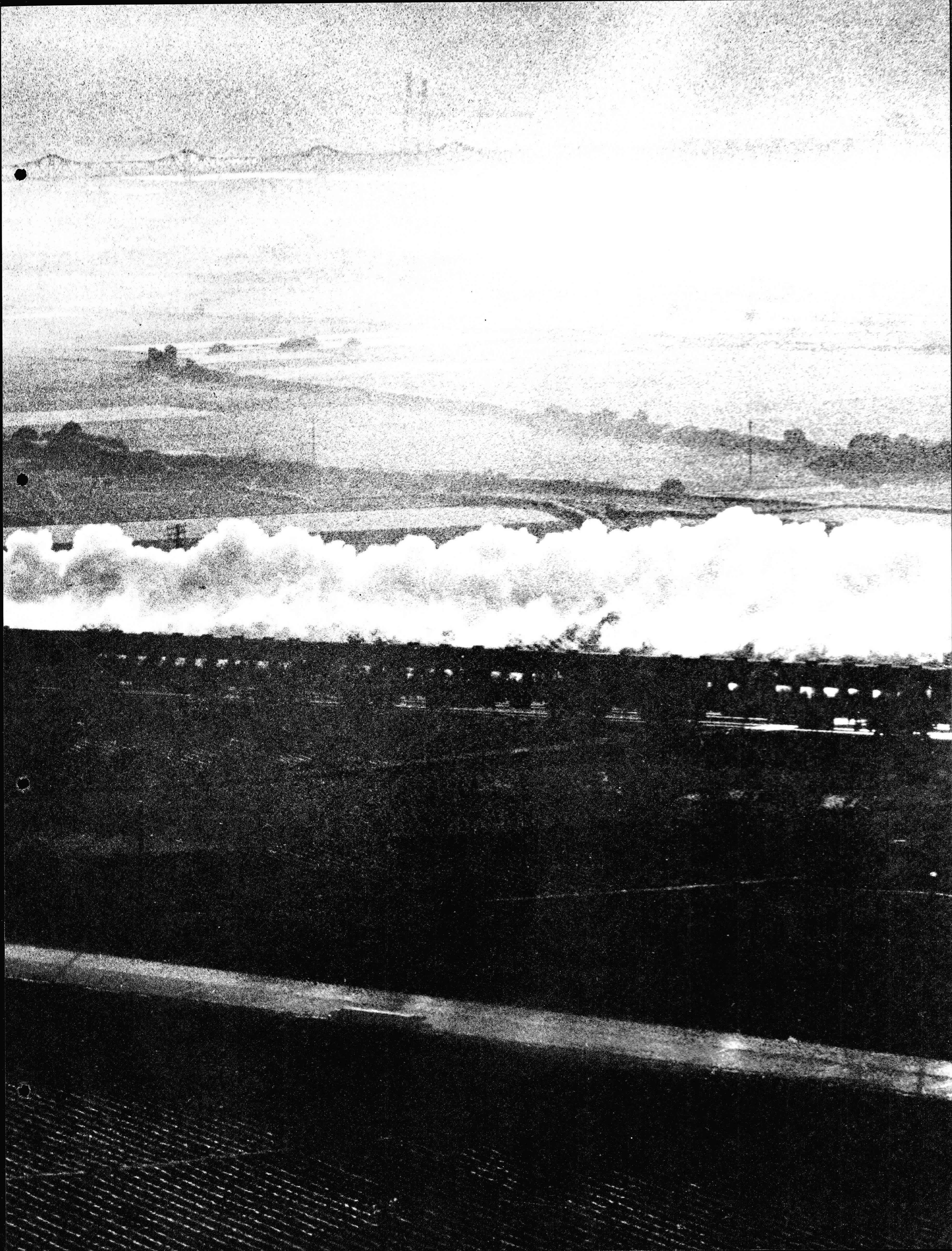


Left: D51 type goods engine. Between 1926 and 1945, a total of 1,115 D51 were produced and so this type is the most popular of all steam locomotives used in this country. Weight: 77.7 tons; total length: 19.73 meters; diameter of driving wheel: 1.4 meters.

Toyama Engine Section in the morning. It will soon become impossible for one to see such scene as this, for all steam locomotives which played a vital role in the development of the country are expected to be put out of commission in five years' time.



The first train of the day, pulled by a D51, came along. It was a quiet, windless morning. A shaft of sunlight breaking through the clouds lighted up surface of the river. The place is an ancient battlefield.



UNDERWATER REVUE OF BEAUTY AND FANTASY

The curtain of the underwater theater is not made of cloth, but consists of iridescent foam. The stage is a giant water tank, and countless small red and blue foam rises along the inside of a transparent tempered-glass wall facing the audience. When the foam vanishes, a revue starts to unfold in a beautiful, fantastic underworld inside the glass wall. The large-scale revue, without parallel in the world, is staged with enthralling charm for an hour. Its story is that of a boy who is guided to the bed of the sea by a mermaid where he has varied adventures.

The boy, the mermaid and many other characters appearing in the drama freely swim about like real fish, performing in precise harmony with the words and music broadcast separately to the audience. The story unfurls with such natural smoothness that audiences, both young and old, are gradually led into the world of fairy tale.

The underwater revue is the brain child of Miss Reiko Kondo, who is still in charge of making up, directing and choregraphing the drama and dance. For the past 30 years, she has been tackling the task of popularizing ballet through stage, screen and TV. It was five years ago that she hit upon the idea of underwater revue while watching an underwater show at an inlet in Florida, the United States. She immediately set about collecting ballerinas capable of diving and training them hard to have her dream come true. Miss Kondo had a difficult time gathering qualified dancers, since even good ballerinas had to be dropped because of their inability to dive, while those applicants who could dive but could not dance well were also disqualified. Moreover, she had to create proper costumes for underwater performances as her plan was without precedent.



The underwater theater has a seating capacity for 1,000. The resplendent underwater revue unfolds inside the glass panels in the front.



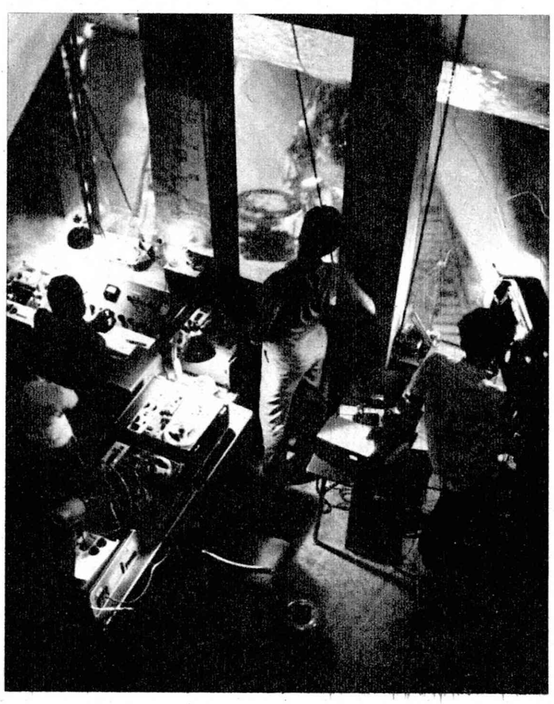


In October 1964, Miss Kondo's underwater ballet troupe presented its first performance at the world's biggest underwater theater, the Ryugujo Sea Palace at Yomiuriland, a major playground in the western suburbs of Tokyo. The theater seats 1,000 and has a giant water tank—that is, a stage—holding 4,300 tons of water which is 11.7 meters deep.

The tank is marked by various innovations and it is said that five patents have been taken out in this connection. At the bottom of the tank, for instance, are six dome-shaped "air stations," where performers can be free of water from the chest up to breathe during a pause. In addition, microphone-shaped pipes for inhaling compressed air are fixed at various points. Therefore, performers can breathe through these pipes or in the "air stations" which are not visible to the audience. Moreover, they can hear through underwater loudspeakers the same words and music as broadcast to the spectators.

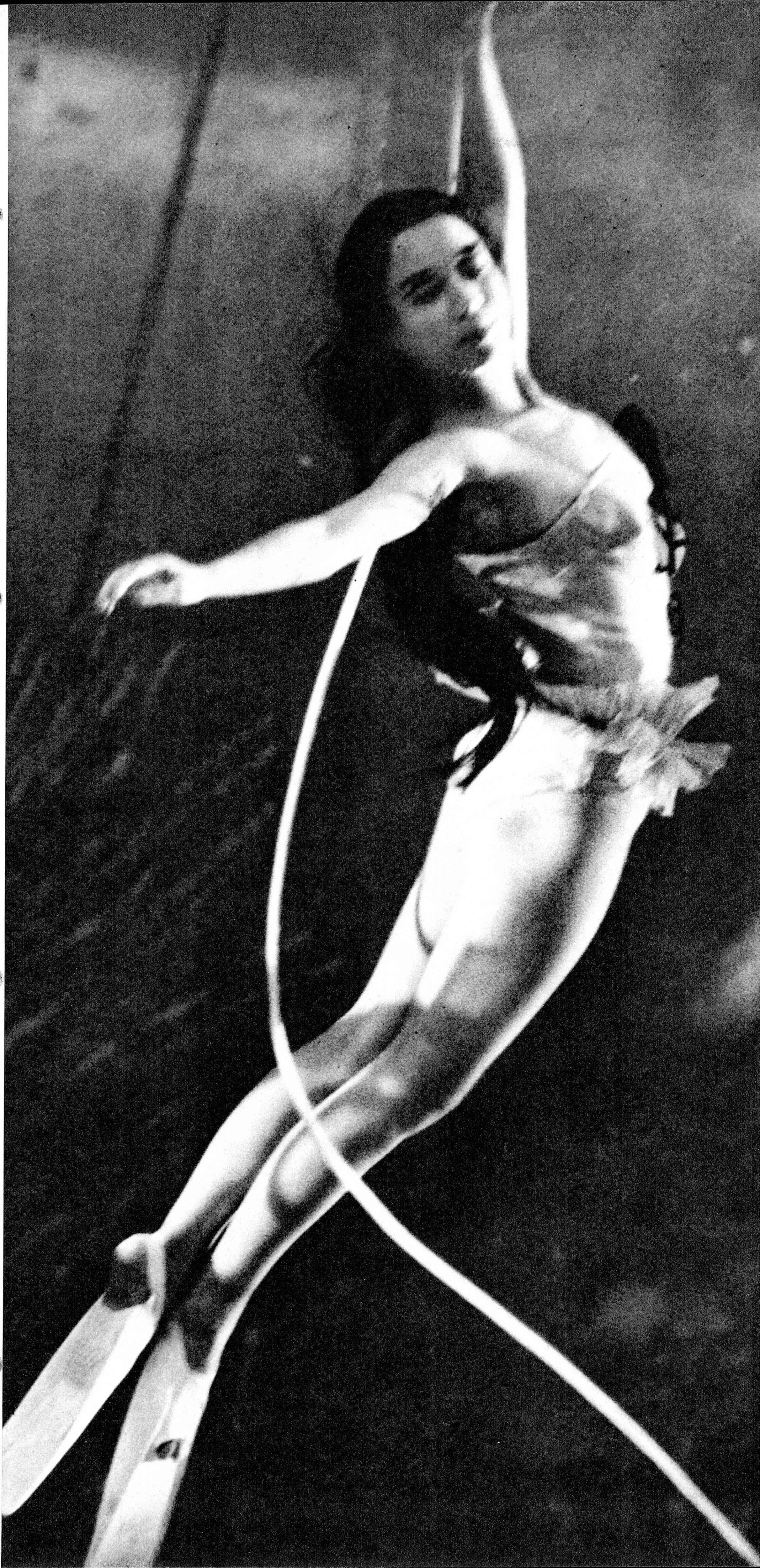
Yomiuri land's underwater revue received the "Encouragement Prize" last year in the Mass Entertainment Division of the Art Festival, sponsored by the Education Ministry. It was thus praised for "cultivating a new field of popular art with an epochal idea and beauty."

"There are various obstacles in the water. But if you overcome these, you can create greater possibilities than on the ordinary stage. To be sure, there is greater resistance in the water than in the air. But when we jump, we can prolong the time of temporary standstill at the top of the jump. We can also enlarge upward and downward motions, creating all the more dynamic poses. I believe a sort of weightless state in the water holds a great possibility of fostering a wonderful form of art," said Miss Kondo confidently as leader of the underwater revue troupe consisting of 30 female and 10 male dancers.



Above: Control room for illumination and acoustics. Left: Pipe for breathing is held in the hand of mermaid. Dancers can perform for nearly two minutes without using the pipe.







In the water, performers can stand still with an extended posture and enlarge their motions, making it possible to create dynamic poses. Leading characters do not use underwater glasses, and so their field of vision is extremely limited. They rely upon the "sixth sense" fostered through training and the sound from the underwater speakers.

Three times a week, the sharp yells of children echo in the Major Drill Hall of the Nihon Budokan (Martial Arts Hall) in Tokyo from shortly past 5 p.m. There, little children, holding bamboo swords, longer than their own height, over their heads with both hands, are seen darting at instructors, while older children brandish their bamboo sowrds vigorously in repeated attempts to break through the solid defense of skilled instructors. These children, always in high spirits, numbering 40, are pupils of the Children's Class of the Budo Gakuen School.

Kendo (swordsmanship), like *judo,* is a traditional sport deriving from its ancient *bujutsu* (martial arts) using bamboo swords. Participants wear protectors on the face, arms and chest, and attack is limited to these three parts of the body. *Kendo* has been adopted as regular course at schools, and all-Japan *kendo* championships of senior high schools, universities and the general public draw multitudes of spectators. Japanese *kendo* is often compared to Western fencing. But as is clear from the difference in the structure of sword, *kendo* aimes at "cutting" the opponent—that is, "striking" in the case of the bamboo sword used in *kendo* as sport—in contrast with the "thrust" of fencing. Generally speaking, *kendo* looks livelier and more stirring than fencing. The sharp yell uttered in attack, the sound of the bamboo sword striking the opponent's protector and a shift to direct grappling at close-quarters—all this strikes one as rather rough compared with fencing. The practice suit, marked by *hakama* (divided skirt), and protectors are the same as those used 300 years ago.

The children assemble for practice every Monday, Wednesday and Friday at the Nihon Budokan in the vicinity of the Imperial Palace. Aged from five to 12 or 13, the sprightly

FORTY TINY

The "Kendo" lesson takes at least three hours, including commuting time, which take up the children's ordinary study hours. But the instructors and mothers proudly say that none of the children have declined in their school records since starting "kendo" practice. Right: It is an ironclad rule to fully extend both arms when striking the opponent with a bamboo sword.

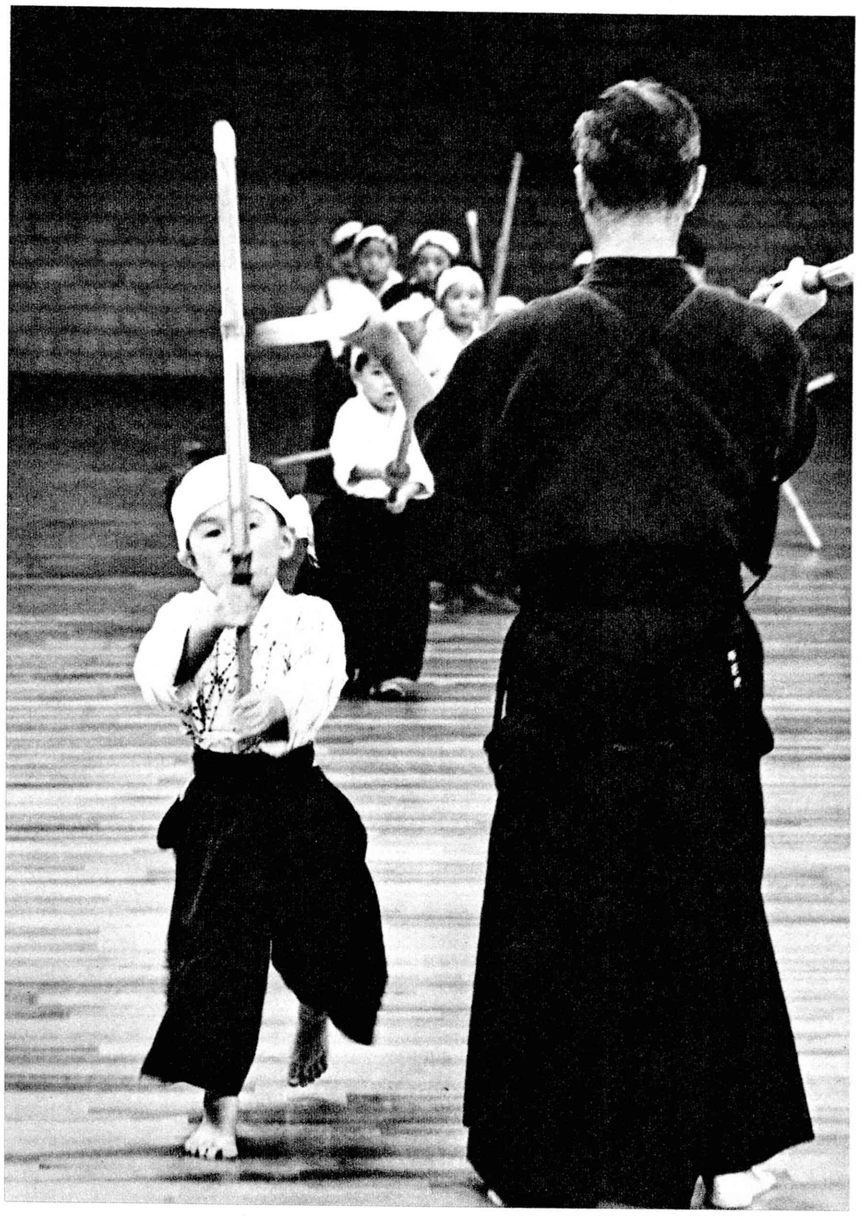


youngsters come in groups or by cars driven by their fathers or mothers. As soon as they change into the *hakama* suit, they dart into the drill hall. Until the instructors show up, this spacious hall, used for *judo* matches in the Tokyo Olympics, serves as a big playground for the children. Once the instructors enter, however, the hall instantly turns into a sacred place for practice. The children sit down squarely in a row, bow politely and listen to various instructions. Then they divide into three groups—beginners, middle and higher class, followed by a rigorous practice, starting with basic motions of shuffling forward and backward with the bamboo sword at the ready, and the swinging down of the sword from overhead.

The Children's Kendo Class is not aimed at bringing up first-rate swordsmen. As with all other sports, *kendo* has the ultimate objective of fostering a fine character. It is used only as a means of acquiring the sense of justice and peace as well as decorum. The instructors with a wry smile said: "We are having a really tough time, since children of today are not adequately trained in group life." To be sure, five and six-year-olds look very carefree, and scarcely feel any need to obey the instructors' words, it is said. As trainees, they are of course compelled to observe the regulations of the school and the rules of *kendo* as well as the instructors' commands at all times. Don't they get fed up with such strict practice and stop coming to the school? The answer is "No." Oddly enough, they attend *kendo* classes without fail as if to enjoy the instructors' repeated warnings. But as these children continue *kendo* practice for one or two years, they acquire a definite style of swordsmanship and come to find significance in observance of the rules.

SWORDSMEN





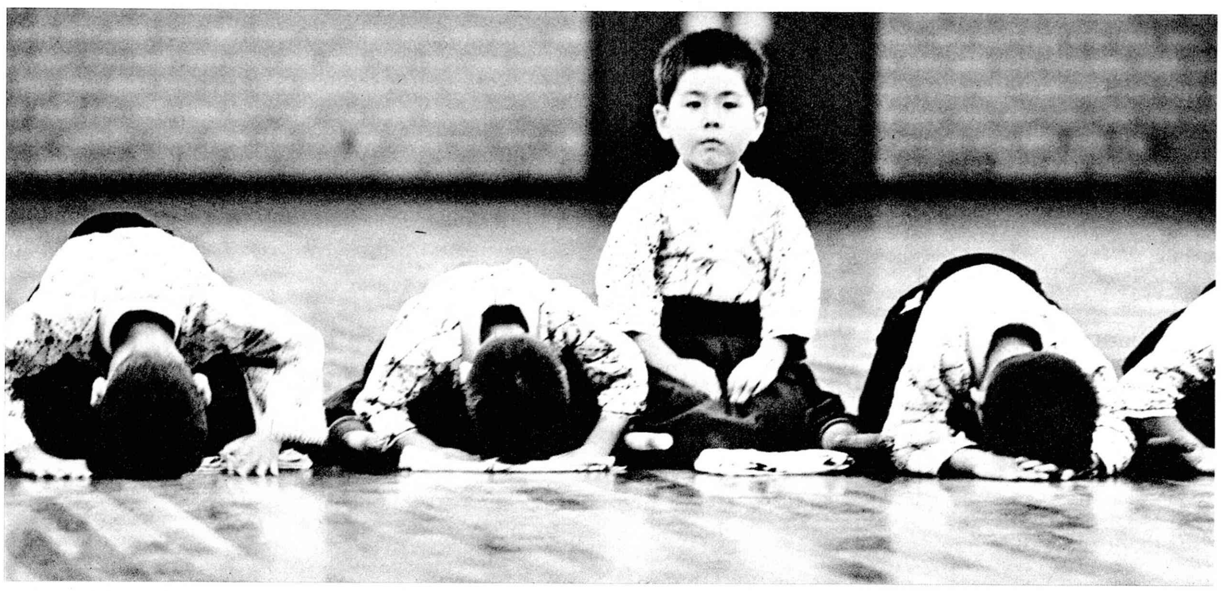


Tiny swordsmen occupy a spacious drill hall, which was once filled with a capacity audience of 10,000 when judo matches were held here in the Tokyo Olympics, and later jam-packed with 20,000 excited spectators—twice as many as capacity—when the Beatles performed there. The hall serves as the children's playground, for social intercourse and finally, for rigorous practice. Below right: Displeased with the presence of a cameraman or in a cross mood one of the tiny swordsmen refuses to bow and stares defiantly into the lens.

Photos by MASAMICHI SUMIYOSHI.

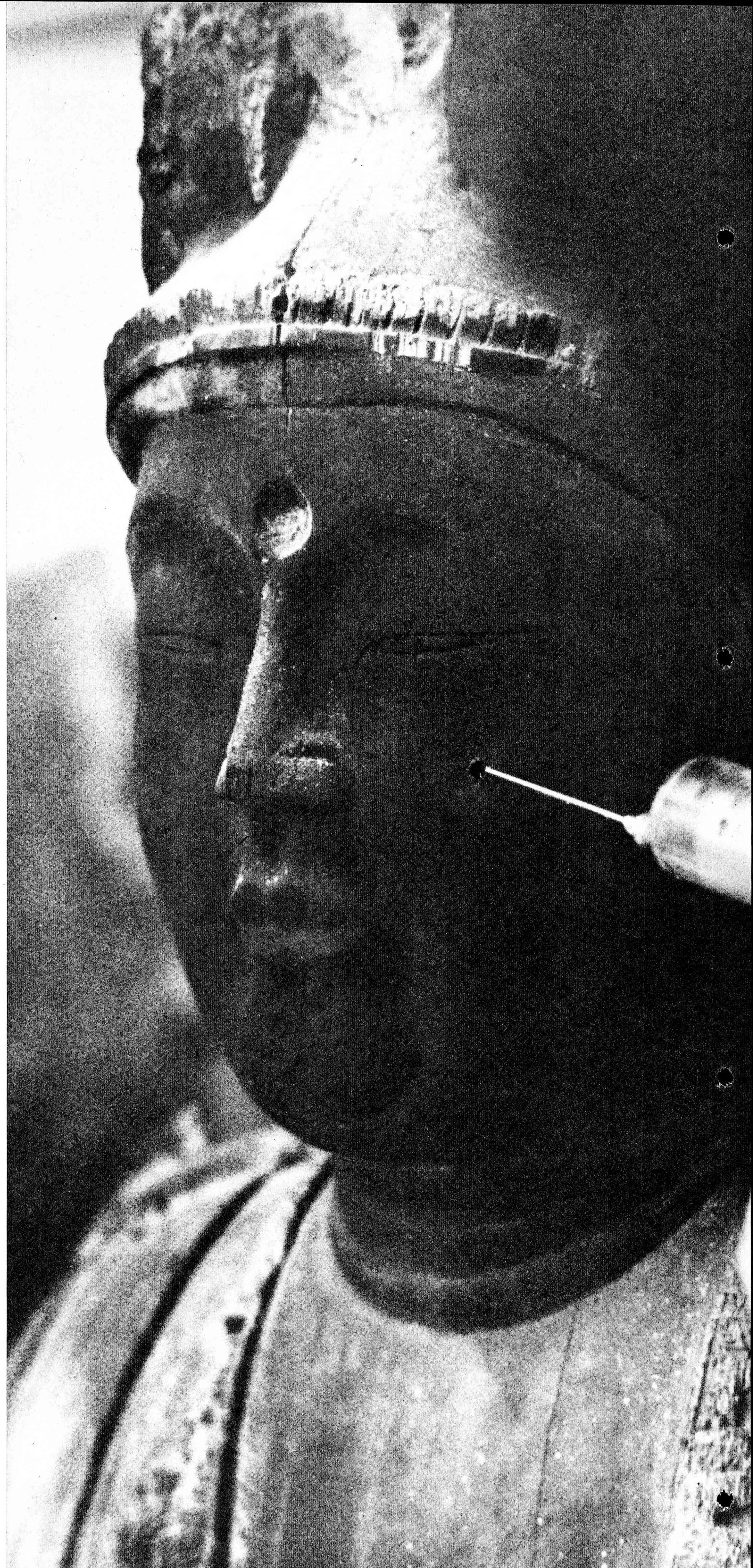




Protectors of National Treasures

Artist who are not allowed to produce works of art



With many ancient temples each with a history of 1,000 years, Kyoto is a comparatively quiet city for its population of 1,400,000. And in a corner of the Higashiyama quarter where roads are lined with old houses, mud walls of temples and trees, there is the National Treasure Repair Office adjacent to the National Museum of Kyoto. Every year, several broken down Buddhist images and those of Shinto deities with facial features already unclear due to corrosion are brought to the repair shop, and after some time, leave there covered with white bandage. Though visited by few people, the repair office has never ceased to give off the sound of chisels and the smell of lacquer for the past 70 years.

Japan abounds in cultural heritage because of its ancient history—not only in variety but also in numbers—such as Buddhist and Shinto images, swords, ornaments, pictures, writings and curios, let alone shrines and temples in all parts of the country. In 1929, the national treasure system was established to accord national protection to cultural assets of especially high cultural, artistic and historical value. But the enemy of such cultural property is not limited to mischievous tourists and children alone. With the passage of time over 500 or 600 years, the connected sections of wooden images fall away and they are weathered and eaten by worms. Bronze images rust, corrode and become disfigured. If our cultural heritage from our forebears is to be handed down to posterity both at home and abroad, constant repair is indispensable. And it is the "National Treasure Hospital" for important cultural property that is performing this role.



Worm-eaten holes are filled with plastic by means of a syringe. He feels as if he were staging a "staring match" with the time-honored Buddhist image day in and day out.

This "hospital"—that is, the National Treasure Repair Office of the Institute of Art—has a staff of 20, including Director Kocho Nishimura. The task of these men is primarily the repair of wooden images. Buddhist and Shinto images brought to the repair shop are all aged more than five centuries. Some of them can no longer stand because of rooted pedestals, while the faces of others are pockmarked with traces of worm eating. These are not usual cases, and there are even images with their heads detached and those which promptly disintegrate into 10 or 20 small wooden splinters, if touched by hand. The mission of the repair shop is to prevent these images from being damaged any further and to convey them just as they are to posterity.

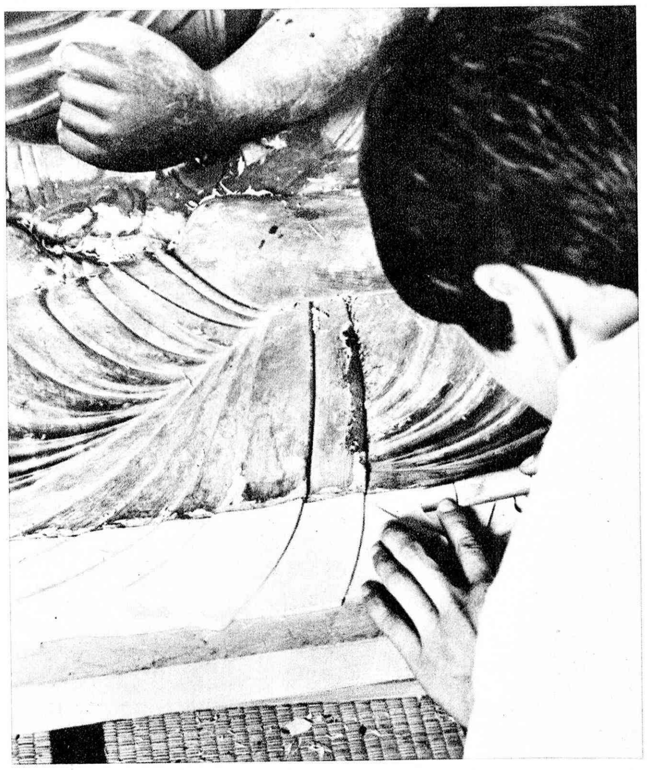
When a new "patient" arrives, the first task is a conference of all persons concerned to examine the state of damage at great length and to study the most effective method of repair. The material, state of drying and repairs made in the past need to be studied and clarified, and the form of the repaired part determined.

For instance, let us suppose a Buddhist image with one of its legs gone is brought to the repair shop. The image cannot stand again unless provided with a new leg. What was the lost leg like? It probably was not much different from the remaining leg, but in what direction were the toes turned? This is surmised from the trace of the foot remaining on the pedestal as well as the shape of the clasp that linked the leg with the pedestal. At the same time, old records are examined for a clue. Then a drawing of a new leg is made and proper wood material is chosen, followed by chiseling. The repair staff tries to make this chiseling work as close to that of the original sculptor as possible. The other sections of the Buddhist image are pockmarked with countless small worm-eaten holes. To stop eating by worms, plastic is injected into each hole with a syringe. The number of holes reaches several thousand sometimes, and the repair of a life-size Buddhist images takes even three to five years.

The techniques of painting and coloring are particularly difficult. That is, the color must be made completely identical with that of other sections which have already spent hundreds of years. Moreover, the color of the repaired part must be prevented from changing differently from that of other parts 10 or 20 years hence. It totally defies prediction if the binding agent, considered best at the moment, would retain the same effect after a century. The reason why lacquer is still used for painting is that the existing works of art have proved that lacquer is durable for more than 1,000 years. The difficulty of the repair work is that the effectiveness of the present repair methods cannot be assessed until after 50 or 100 years. Sometimes, the repair staff comes upon an image once repaired 100 or 200 years ago. But the clumsiness of the ancient repair techniques makes them renew their determination never to leave repair work that might be laughed at by posterity.

Several members of the repair staff have already devoted half a century to the task. Seitaro Sakayori is one of them. For 50 years since he was 20, he has repaired several thousand ancient images. The "Sanju-sangen-do" temple, the biggest tourist attraction in Kyoto, has a spectacular array of one thousand and one Buddhist images. And all of these images have been taken care of by Sakayori. In a work room set up next to the temple, he spent every day with the Buddhist images covered with gold leaf. During the last war, it was difficult to obtain gold leaf. After the war, Sakayori said, gold leaf was not obtainable without the signature of General Douglas MacArthur, commander of the Occupation Forces. During the war, Sakayori and his fellow workers carried ancient images from big cities and suburban areas on their backs to the countryside to save them from air raids. As Japan recovered from the devastation of war and returned to normal, Sakayori's repair work picked up speed and he finally completed the last Buddhist image of the "Sanju-sangen-do" in 1956 with the cooperation of fellow workers. And it was not until then that Sakayori became aware he was already an old man. In that year, an entry reading "Finished, Sanju-sangen-do, one of the selected repair objects" was made in the record of the Education Ministry responsible for the preservation of national treasures.

Continued on Page 54

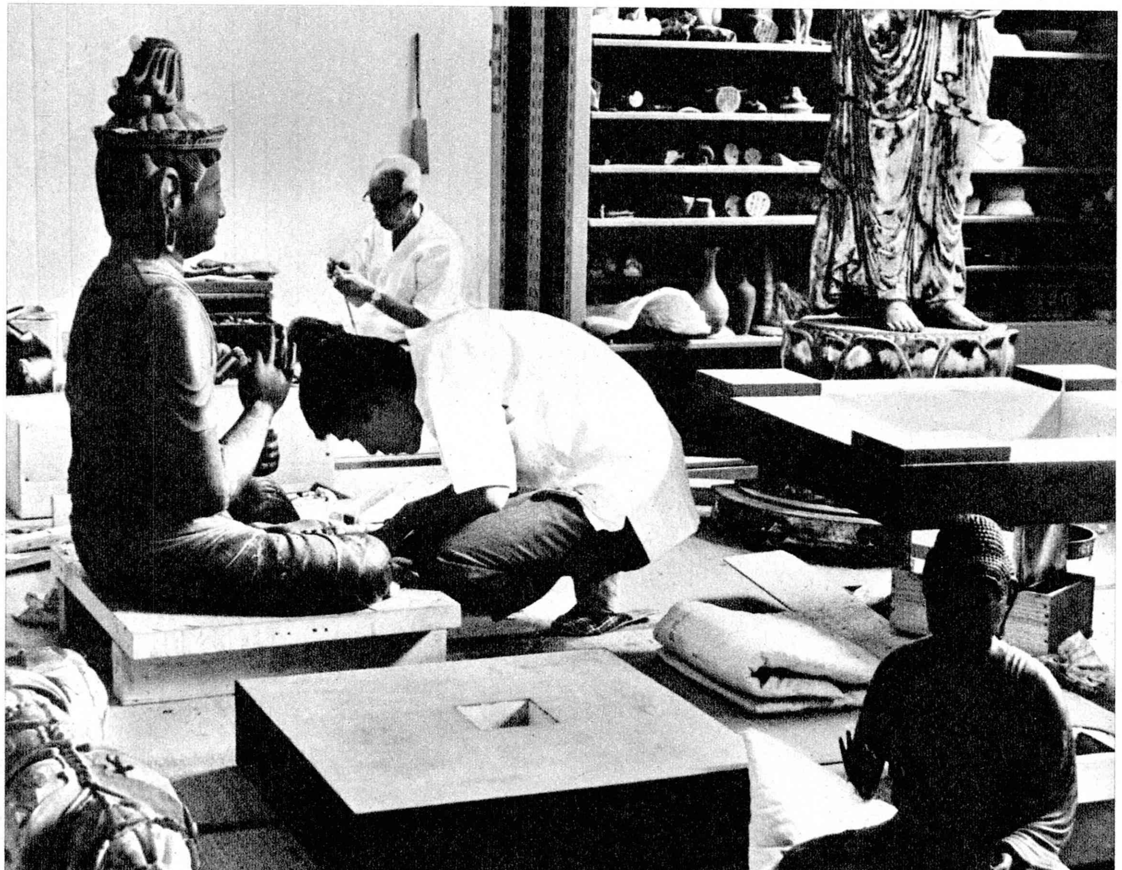






Above: The worm-eaten part of the Buddhist image's hair is shaved off and processed with anti-worm chemical. Then each hair is pasted on one by one in a style peculiar to the image. Above left: A young repairman chisels a pedestal as if he were kneeling before a Buddhist image. The chisel moves just like his own fingers. Left and right: Surrounded by the Buddhist images of various types, the staff continue to chisel, paint and color.





Photographs by NORIHIRO WATANABE.

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There are not a few young people who want to join the staff of the National Treasure Repair Office. But it takes at least 10 years before they master the required techniques. The first three years are spent in learning how to use tools and handle cultural assets. Then while deepening their knowledge of Buddhist images, they steadily acquire the basic techniques of chiseling, binding and painting. Judgment and analysis of ancient works of art can be done by means of modern science, but the repair work itself leaves no room left for the use of machines. As techniques and knowledge become deeper and wider, the repairman becomes able to tell, at first glance, not only the kind of a Buddhist image brought in and the time of its completion, but also where it is preserved and in what state.

Needless to say, there are a great many cultural assets in Kyoto and Nara. But over the past centuries, many have been dispersed to various parts of the country through diverse channels or incidents. Not a few Buddhist and Shinto images are worshipped in coastal and mountainous villages as guardians for the local populaces. Depending on localities, the staff goes to them for repair work. In most cases, however, such images must be carried to the repair shop in Kyoto. With the advent of winter after the end of farm work, villagers hault their guardian images out of temples on mountains by sleigh and deliver them to Kyoto. They entrust their precious images to the repair office, placing full confidence in its staff.

The staff has superb skills and excellent knowledge and esthetic sense. But one thing agonizes them. This is that they are absolutely barred from further improving the ancient works of art on the basis of their own judgment. In repair work, individuality must be completely suppressed. Moreover, even when a finger is missing from the hand of a Buddhist image, the repairman is not allowed to add a new one. For his work is confined to the "absolute minimum necessary for the preservation of the status quo" except, for instance, when an image cannot stand unless provided with a leg. It is a duty to fill worm-eaten holes one by one. But it is prohibited to add even a single sword or finger. The repair of works of art is indeed a very peculiar work. For the repairmen's job must not be to produce a work of art. But their techniques themselves may be a supreme form of art. Discarding their individuality, these men grapple with ancient Buddhist images with chisel, syringe and lacquer painting brush just to serve as a bridge between the past and the future. But their atmosphere of tranquility and composure seems to be of the same quality as that exuded by ancient Buddhist images of various kinds and ages which surround them.







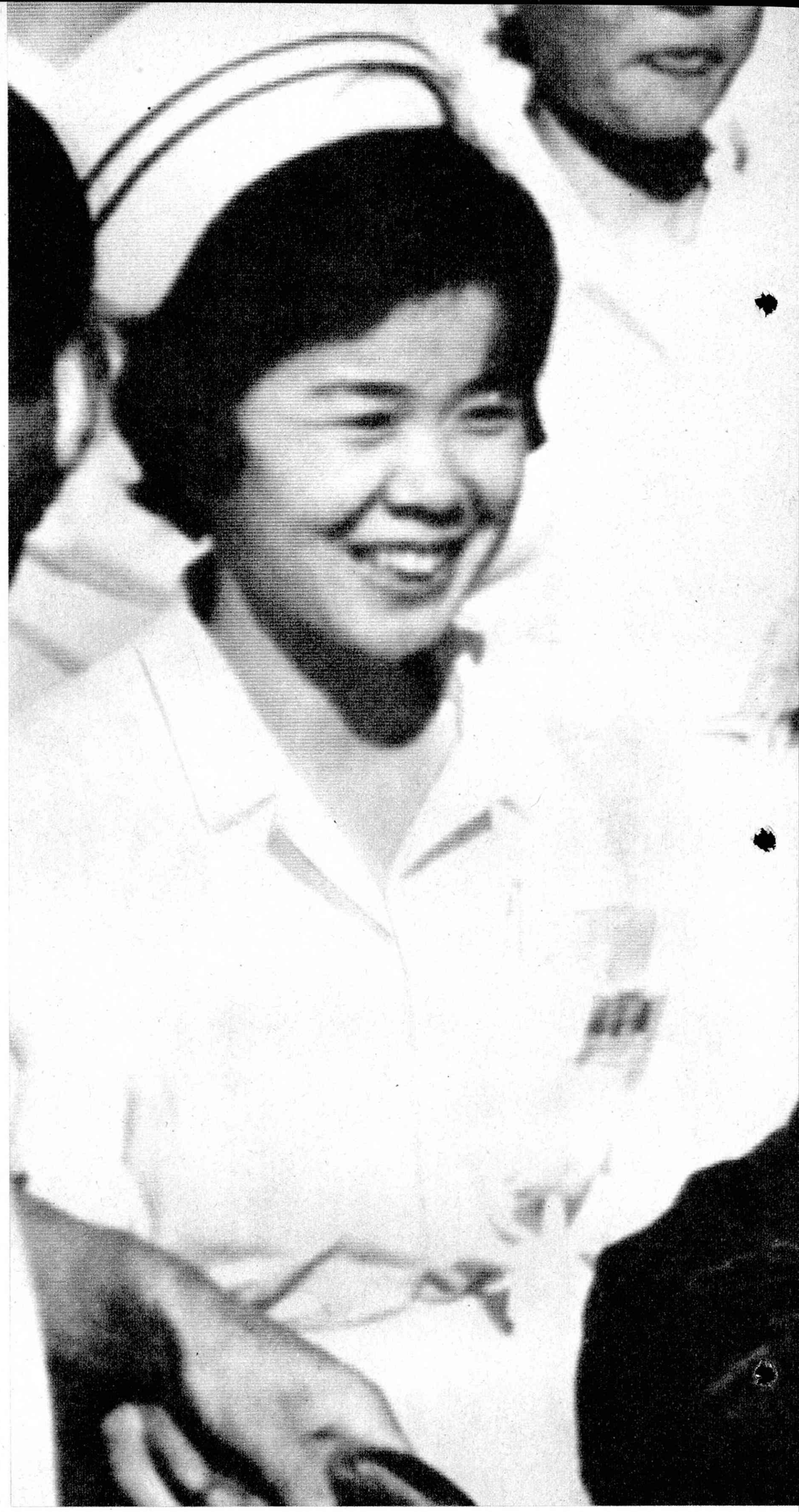
Left: When he stands before each of the thousand and one Buddhist images of the Sanju-sangen-do temple, Sakayori recalls 20 years of hard work. He whispered: "I have a feeling that I can now understand what these Buddhist images have to say. Above: A repairing room of the "national treasure hospital."

Nobuo Miyazaki, aged 18, is on the way to recovery after undergoing on August 8 Japan's first surgery for heart transplant. Seventy days after the delicate operation, there were still no signs of the feared rejection of the transplanted heart. The leading roles in this human drama revolving around two lives were played by Nobuo, the donor Yoshimasa and Prof. Juro Wada, the surgeon who performed the operation at Sapporo Medical College Hospital.

THE drama came to a climax 2 days after the operation, on August 10, when the two families—the recipient's and the doner's—who now had blood ties, came together in an unusual meeting. Raising his voice above the murmurs of the 50 news reporters who packed the makeshift press room in the hospital, Prof. Wada, 46, announced: "I have good news for you. So far, the donor of the heart has remained anonymous at the request of his bereaved family. But, today, the parents of the donor have asked to see Nobuo and his family to cheer them up. I have been deeply concerned about the circumstances of the donation, but now I am relieved as the whole Yamaguchi family is here, proving that my worries have been unjustified. . ."

His voice quivered and he finally choked with tears. He was overcome with emotion —this veteran surgeon with 15,000 operations (3,000 of them on the heart) to his credit including the nation's first and successful heart transplant.

The two families were tense as they sat with drooping heads. One was trying to recover from the sorrow of the loss of Yoshimasa, 21, the eldest son, who had drowned while swimming. The other was about to have the life of an equally youthful member saved through the generosity of a group of strangers.



ONE LIFE RATHER THAN

JAPAN'S FIRST HEART TRANSPLANT

After a moment's awkward silence, the two fathers—Takashi Yamaguchi, 45, and Takeo Miyazaki, 56, both of them company employes —shook hands. The mothers—Sumie Yamaguchi, 44, and Tomi Miyazaki, 50—clasped each other's hands. Tomi managed to say, "Thank you so much" before she broke down in tears burying her face in a handkerchief.

For two and half days following the Japanese history-making surgery, the former owner of the heart sewn into Nobuo had not been revealed.

Soon after Yoshimasa Yamaguchi was pronounced dead, his father was approached by Prof. Wada: "I have a patient who needs a healthy heart. Would you consider giving him your son's?" Takashi had known the great medical significance of heart transplant. But he had never dreamed that his own son would ever be involved in such an operation. As a father, he naturally wished to have the body cremated intact.

Takashi talked it over with his wife Sumie. But she could not bring herself to agreeing. When Dr. Wada left the couple alone, she peeped into the high-pressure oxygen chamber where her son had been placed. Although he was medically dead, with no emission of brain waves, she saw a team of doctors still doing what they could in a desparate attempt to revive him. She made up her mind then and there. "If Yoshimasa cannot be saved after you have tried that hard, please use him so he can be of help," she said. But Yoshimasa's sister Noriko, 20, and brother Tadao, 17, fiercely objected to the idea. But the parents finally



TWO DEATHS

Nobuo Miyazaki, 18, Japan's first heart transplant patient, waves to reporters on Sept. 6, a month after the operation. To his right is Dr. Juro Wada who led a group of surgeons at the hospital in the dramatic operation.

persuaded them and signed an agreement with the hospital attaching the condition that the name of the donor should never be disclosed.

Dr. Wada retrospects. "What worried me most was not the post-operative conditions of the patient; nor was it the expected criticisms. It was about the Yamaguchis. Even if I could save Nobuo's life, I would be disqualified as a doctor if this operation left an unhappy family. By saving one patient I would have made a few other new ones. This possibility was constantly worrying me. . ."

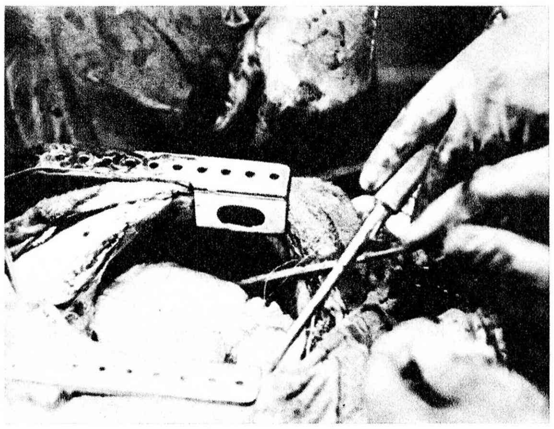
Small wonder, then, that Dr. Wada was moved to tears when all the surviving members of the Yamaguchi family were convinced and even came to the hospital to visit Nobuo and meet the press.

YOSHIMASA Yamaguchi met his death on August 7. A senior in the Economics Department of Komazawa University of Tokyo, Yoshimasa had returned home to Sapporo to take a test for a position with the city office. On August 4, after the test, he went camping on a beach in Otaru with a friend.

On the third day, August 7, about 11:30 a.m. he apparently went swimming alone and drowned. About 12:20 p.m. a boy swimming about 30 meters offshore, found his body lying on the sea bottom, at a depth of about 2 meters. The body was immediately recovered, but the pulse had almost stopped. Nevertheless, three policemen administered artificial respiration for 40 minutes, but Yoshimasa failed to respond.

Then, on the ambulance taking him to Noguchi Hospital in the city of Otaru, his heart suddenly started beating as if by some miracle. Yet, despite all efforts for resuscitation, he remained unconscious.

About 5 o'clock in the evening, a doctor at Noguchi Hospital telephoned Sapporo Medical College for help. "We have a drowned boy with prominent cyanosis. Apparently the central nervous system has been affected. But we are unable to pronounce him dead." The Otaru doctor asked that the patient be transferred to Sapporo hospital and the latter agreed.



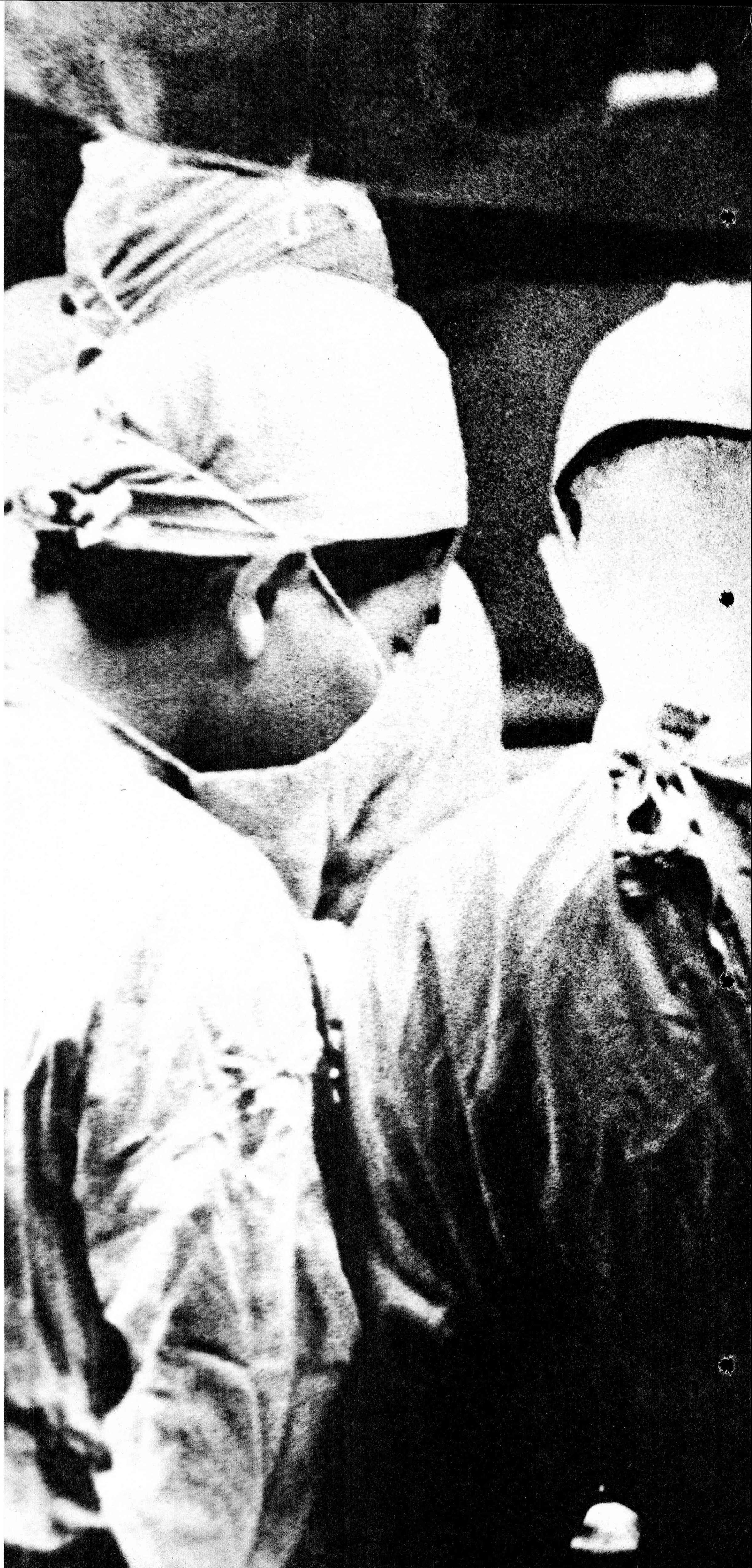
A new heart has been transplanted into the body of Nobuo Miyazaki and firmly fixed.

The medical staff at Sapporo waited with the high-pressure oxygen chamber ready for use. At 8 p.m., the ambulance arrived with Yoshimasa, who was breathing slightly but had an ashen face. Prof. Wada, relaxing at home after a busy day, was called back to the hospital at about 8:30 p.m.

Yoshimasa's blood pressure was measured as 60, but that was as high as it went. Heavy doses of heart stimulant did not work, as the blood pressure reading fell steadily to 40 and then to 30. Ten minutes after he was placed in the oxygen chamber, blood pressure dropped to zero. At 10:10 p.m., brain waves were no longer detectable, and the pupils were dilated. Prof. Wada pronounced him dead and his parents, who had rushed to the hospital, were informed. As the last straw, the doctor ordered the use of an artificial heart-lung apparatus. Blood was circulated from the femoral artery to the femoral vein, while infusing it with oxygen. But even this last resort could not restore Yoshimasa to life.

WHILE Prof. Wada was working desparately to save Yoshimasa, the condition of Nobuo Miyazaki crossed his mind. The only way to prolong Nobuo's life was to replace his heart with a healthy one. And both Nobuo and his parents had been convinced that nothing short of major surgery would save his ilfe.

To ask the grief-stricken parents of Yoshimasa for their dead son's heart was no job for anyone with human feeling. But Prof.





Japan's first heart transplant operation begins at 2:05 a.m. August 8. Doctors' close teamwork enabled the operation to go off smoothly.

Wada steeled his heart and made the seemingly impossible request—for the sake of medical advancement and in the name of humanity. His firm belief is that one life should be saved rather than standing idle to let two lives vanish—if there is sufficient chance of success and if all parties involved consent.

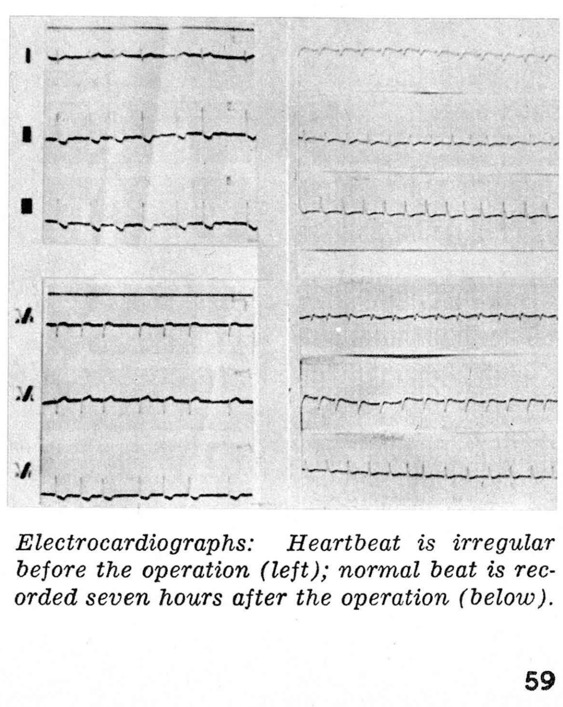
While the Yamaguchis were considering the request, Dr. Wada visited Nobuo for another examination. There was no guarantee that the patient would last a few months, or weeks. In the worst case, his bad heart might give way any moment.

Nobuo had a congenital valvular disorder of the heart. As a child he looked as sprightly as any other. But when he was in the fifth grade, there was a sudden change. An X-ray examination revealed an enlarged heart. In the following eight years, Nobuo alternated between hospital and home.

Then came the big break when, late last May, a friend of his father introduced him to Dr. Wada as one of the top authorities in heart surgery. The doctor examined the boy and found that three of the four valves of his heart were in a bad shape. The case was diagnosed as mitral insufficiency, complicated with two other types of disorders. The patient could be cured by operating on the valves one by one, but he was not strong enough to withstand the major surgery. The only alternative was to switch the entire heart.

On one of his rounds of examination, Dr. Wada asked Nobuo, "How would you like to change your heart?" With a look of grim resolve, Nobuo replied, "Please try, doctor!" From then on, Nobuo tried to finish each meal, in an effort to build up enough strength. His parents, apprehensive at first, finally gave their consent moved by Nobuo's persistent pleas. "If that doesn't work," he reasoned, "you can't help it." So Dr. Wada became preoccupied with the looming reality of a heart transplant.

And now, with the consent of the Yamaguchis, the way was cleared for Japan's first attempt at a heart transplant. Dr. Wada's surgical staff immediately went into action.



Electrocardiographs: Heartbeat is irregular before the operation (left); normal beat is recorded seven hours after the operation (below).

TWENTY surgeons and two nurses were called for a conference. As soon as the conference was over, they scrubbed themselves down, changed into green robes and masks and took their place in the operating room. Each one was assigned specific duties in the close team work, to perform the surgery, administer anesthetics, operate the artificial cardiopulmonary equipment, perform blood transfusion, inject drugs, take electrocardiograms, measure blood pressure and take other records.

Fortunately, the donor's blood type was 0, which meant that the blood was acceptable to those of any blood type. Still better, Nobuo had an AB blood type, which meant he could receive blood of any type. But there was no time to conduct tissue tests to examine compatibility.

Thus began Japan's first and the world's 30th heart transplant operation. The time was 2:05 a.m., August 8, 1968. As soon as general anesthesia took effect, Prof. Wada made a 20-centimeter incision in Nobuo's chest, along the length of his body. On the table beside, surgeons began working on Yoshimasa's body to extract his heart. Four hours had passed since emission of brain waves stopped but the heart had been kept "alive" by a special apparatus at the Sapporo Medical College.

When exposed, Nobuo's heart, which had lost most of its function, was found to be four or five times the normal size and to occupy 60 per cent of the chest cavity. But it took only 13 minutes to remove the swollen heart. What kept Nobuo alive without a heart was a new type of cardiopulmonary apparatus developed last year by Dr. Wada and his group. Having oxygen pumped into his blood stream by this apparatus, Nobuo remained in a deep sleep all the while.

Then, without an instant's delay, Yoshimasa's heart was planted in Nobuo's exposed chest. Nobuo's blood vessels were quickly joined to the interauricular septum, left auricle, right auricle and the pulmonary artery, in this order. The transplant was completed in 45 minutes. Now, the cardiopulmonary apparatus was disconnected. The surgical team watched with a mixed feeling of apprehension, hope and confidence. Soon, the blood pressure climbed to 130. And three minutes later, the new heart started to beat in Nobuo's chest. "We've done it!" the staff cried in a hushed voice. The surgeons then sewed up the incision with utmost care and Nobuo was wheeled out of the operating room. The time: 5 a.m.

Still dressed in his green robe, now soaked with blood and perspiration, Dr. Wada hurried to the room where Nobuo's parents were waiting. "Mr. and Mrs. Miyazaki, I'm happy to tell you that the operation was successful. You have nothing to worry about now." The father and mother just managed to repeat "Thank you, doctor." They could find no other words.

Dr. Wada jumped into a hot bath, as customary after performing an operation. The difference was this time he didn't feel the usual exhaustion after a difficult operation. Presently, his wife, who had stayed awake all night at home, visited him at the hospital. She brought a cold melon for him and his staff, to congratulate them on their success.

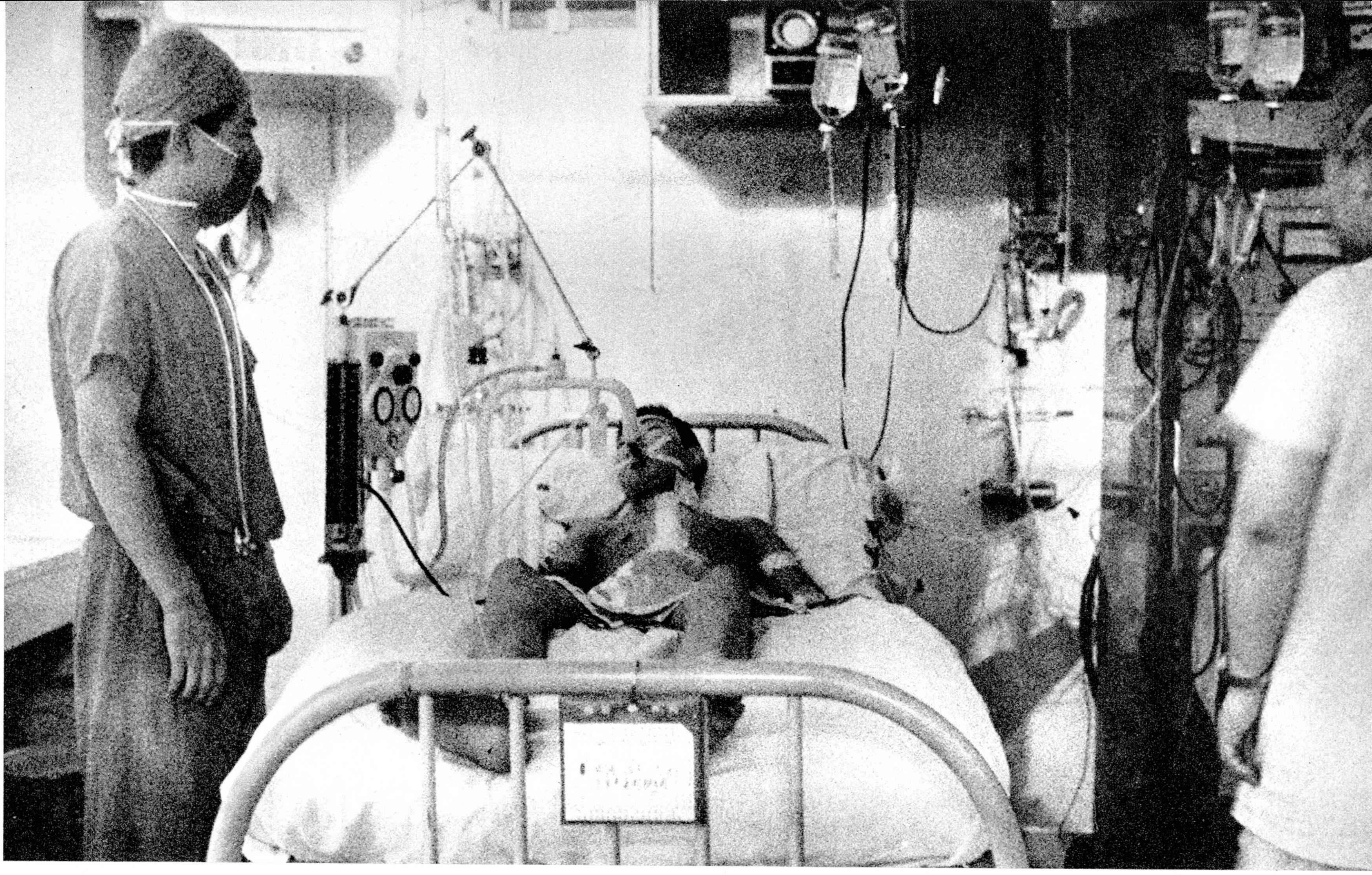
At 2:20 p.m., on August 8, Dr. Wada showed a radiant face at a press conference to announce that "the first heart transplant in Japan has been successful." This was nine hours after the end of the operation. Accompanying Dr. Wada at the press conference, all the other doctors who took part in the surgery were equally cheerful. Nobuo's condition was better than they had expected. In contrast, the newsmen appeared excited at the disclosure of the success, which was not quite anticipated. As the news was flashed throughout the world, cables of congratulations came pouring in.

JURO Wada was born in March 1922 in the city of Sapporo, the capital of Japan's northernmost main island Hokkaido. He graduated in 1944 from the College of Medicine, Hokkaido University and in 1952, when he was working part-time at the medical college, he visited the United States to further his knowledge and brush up his skill at the University of Minnesota, Ohio State University and Harvard University. Among the fellow researchers at Minnesota there was the South African, Dr. Christian Bearnard, who last December performed the world's first heart transplant. Upon return home in 1954, Dr. Wada was appointed chief of the chest surgery group formed in 1953 at the Sapporo Medical College as the first such group in Japan.

The first impression that Dr. Wada gives a stranger, with his boyish and friendly face, is



Emotion-packed meeting between the families of heart donor Yoshimasa Yamaguchi and recipient Nobuo Miyazaki with Prof. Wada as go-between. On his right is the mother of Yamaguchi and on his left, Miyazaki's mother. Standing behind (from left to right) are Yamaguchi's younger brother, sister and father, and Miyazaki's father in that order.



Miyazaki receives post-operative treatment in an intensive-care unit, a strictly aseptic room, of the Sapporo Medical College Hospital.

far from the image of the honor student that graduated from college at the top of his class. He is highly rated for his many achievements including the development of artificial heart valves and cardiopulmonary apparatus. His surgical skill has gained such fame that not a few patients have visited him from abroad seeking his treatment.

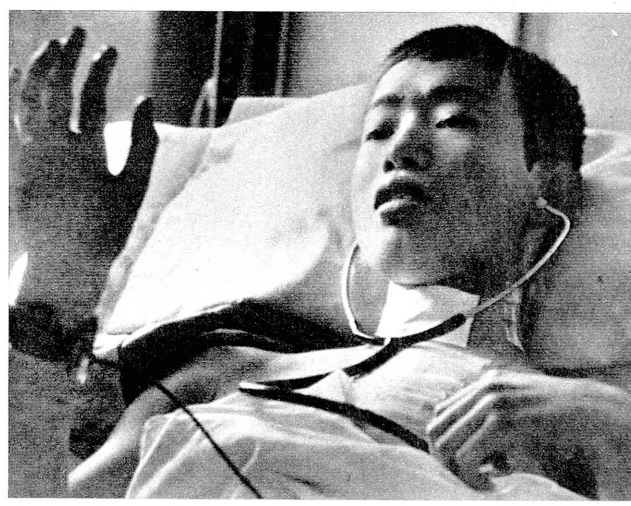
When he learned of Dr. Bearnard's heart transplant in South Africa last December 3, Dr. Wada felt that he had been "beaten," not out of simple jealousy but in a frank reaction that any surgeon striving to break the barrier would show. Anticipating the day when heart transplant would become common practice among surgeons, Dr. Wada since about 8 years ago had been pursuing research with animal experiments. During these years he had collected an enormous amount of data, and had been fully prepared to undertake an operation "any time," he says.

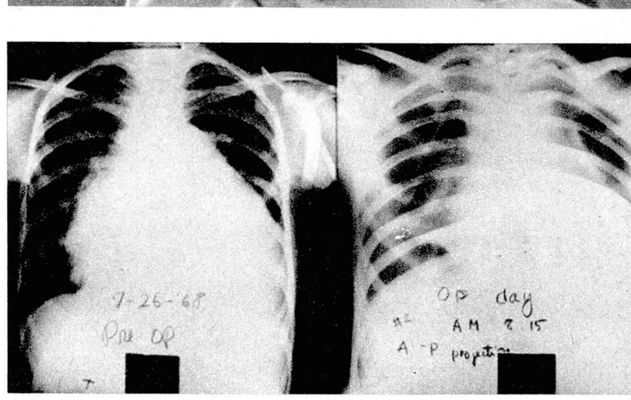
On the other hand, Dr. Wada had entertained some misgivings about this operation. Upon hearing of the world's first transplant, he mused: "There are some unknown factors in heart transplant. With such factors yet to be cleared up, can one possibily be allowed to perform the operation on man? Medical advancement, of course, is inevitably accompanied by a certain degree of risk. But this risk must be given sufficient backing not to make it a risk any more. At present, we must concentrate on finding sufficient backing for the risk."

Later, Dr. Wada changed his stand as he was faced with the fact that several patients had survived the major surgery. As a student and surgeon specializing in this field, he decided, he should accept these facts in a forward-looking posture, "now that more patients have actually survived the surgery and its success can be explained scientifically in a more convincing way."

When Dr. Wada was invited to visit the United States for three weeks last May, he left these words with his staff: "During my absence, if you come across a patient who can never be saved without a heart transplant, if you can get hold of a donor, and if all other requirements are met, then I want you to go right ahead with it." By the time Nobuo was admitted to the hospital, last July 5, Dr. Wada apparently had gained sufficient confidence in such an operation and had been well prepared to perform one.

MEANWHILE, the general public in Japan had thought it was only a matter before Japanese surgeons would come up with their first attempt at heart transplant. This is because of the high standards of Japan's heart surgery. But, as in everything, there were dissidents—some were outright opposed to such surgery while others urged prudence. At a Tokyo meeting last July of a preparatory committee formed by medical and judicial experts to discuss enactment of a law concerning transplant of human organs, the dominating view was that transplant operations should wait until such a law is enforced—possibly in about two years' time—





Above: Miyazaki listens to his own heartbeat with a stethoscope 12 days after the operation. Below: X-ray pictures: Enlarged heart observed two weeks before the operation (left); normal heart after the operation (right).



Photo. Hidetsugu Hidaka

to set forth the legal standards for determining the death of a donor.

Under these circumstances, heated controversy erupted at the news of Japan's first heart transplant performed by Dr. Wada. Voices praising him for his professional skill and courage were invariably mixed with those of critics who claimed "the time is not ripe."

In a heart transplant, the donor, of course, must be proved to be dead beyond the faintest doubt. On the other hand, the donor's heart must be removed as early as possible, while it is "alive." Thus, how to judge one dead assumes primary importance. Usually, a doctor announces "certain death" when the heart stops beating, breathing stops and the pupils are dilated. But this is simply a time-honored practice. Even if the heart is still beating,



Above: "When a person is pronnounced dead and another certain to die, it is necessary and also the doctor's duty to save the latter's life by medical science," says Prof. Wada. Right: The group of doctors, which has performed Japan's first heart transplant operation. Excepting its leader, Prof. Wada, 46, all of them are very young—seven in their thirties and 12 in their twenties. The youngest is 26.

Photographs by KYODO PHOTO SERVICE.

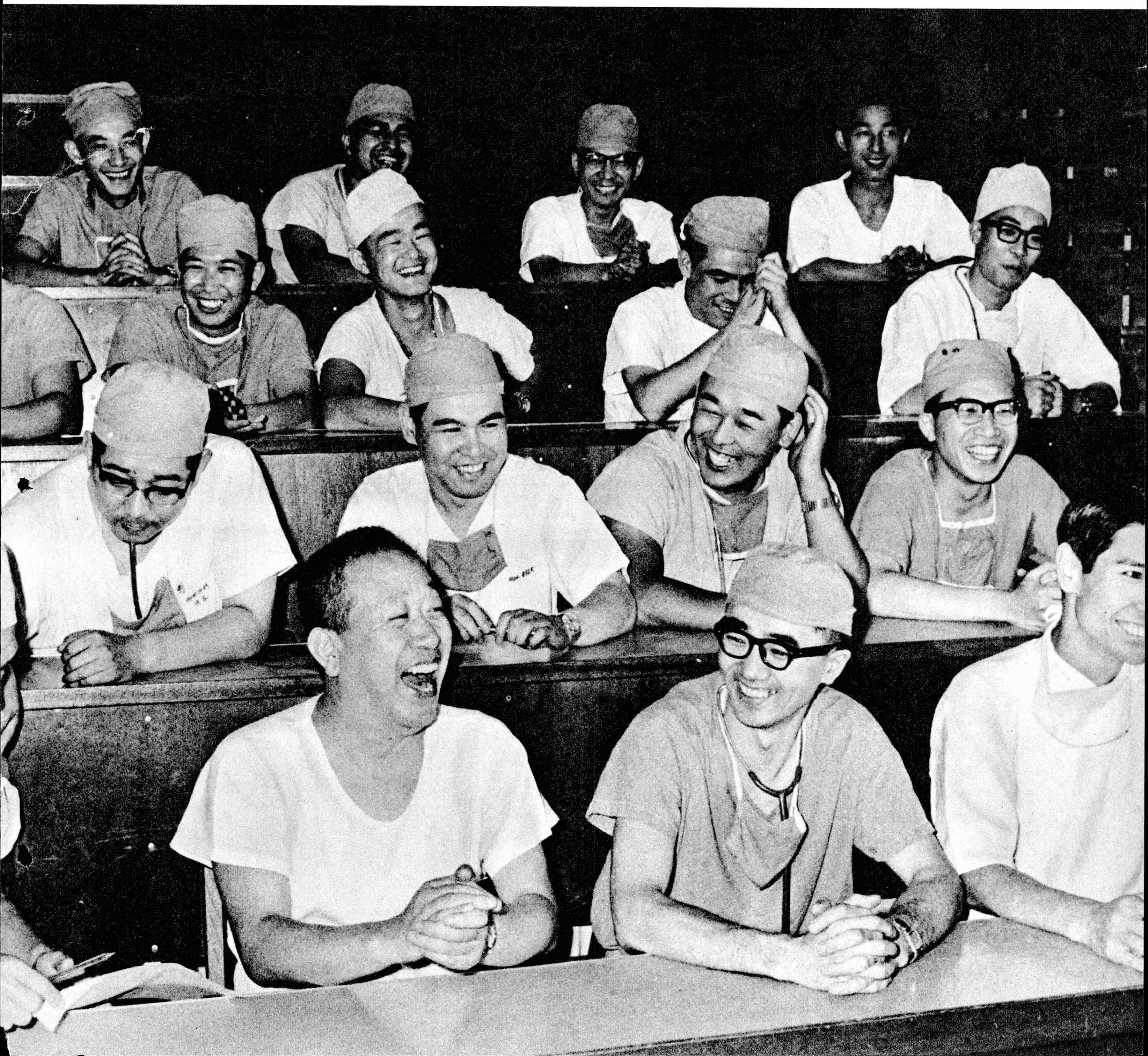
loss of brain function means the loss of all functions as a human being. Moreover, the great advances in cardiopulmonary devices have enabled physicians to keep the heart beating long after the brain stops working. On this basis, the view has gained ground that one should be determined dead when brain waves are no longer detectable. The heart is nothing more than a pump that circulates blood throughout the body. In fact, those physicians who have performed heart transplants used the brain wave as the criterion for determining death.

But it is a completely different matter whether this idea can be sold to the general public. For there is a deep-rooted concept that the heart is the symbol of life. And this concept has provided the foundation for criticism against the recent surgical venture. But it is this sort of cricitism that every pioneer in any field is exposed to and must withstand and overcome.

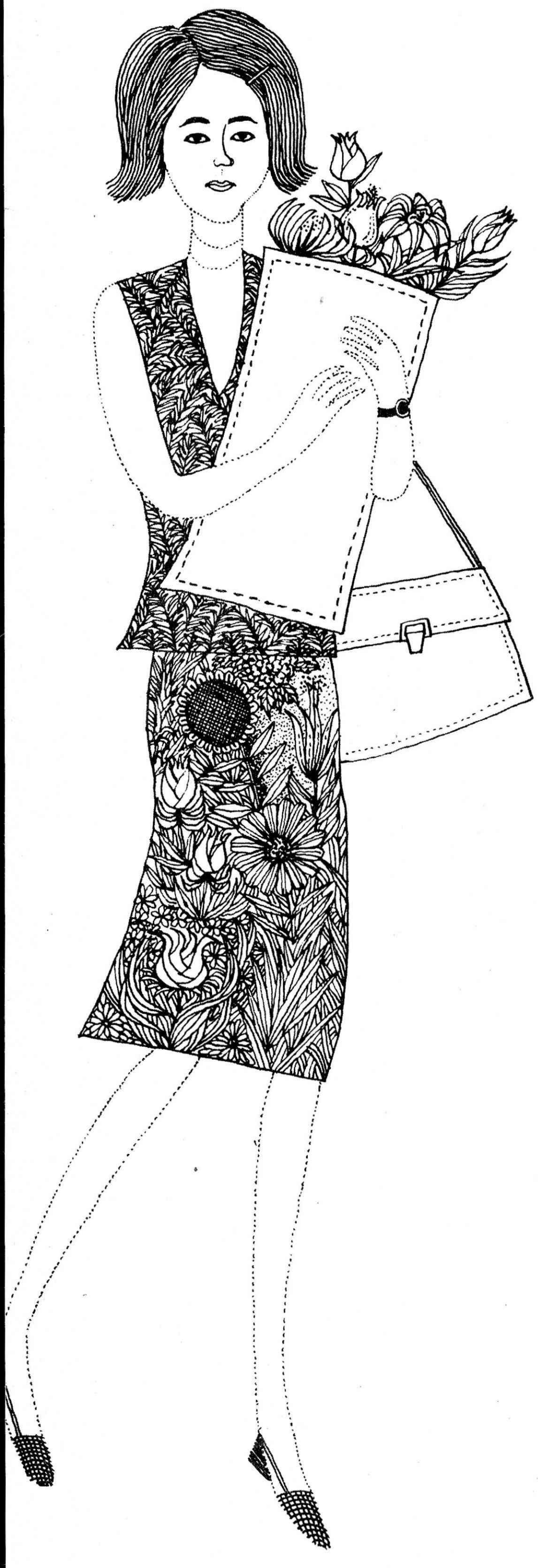
Says Dr. Wada, "I'm a scientist. I have no religion. Those who have come into this world must die some day—this is my philosophy on death. I judge one dead when his brain is "dead," that is, when it ceases to function. When two persons are dying, and if one of them can be saved by medical means, this must be done by all means. It is the doctor's duty.

"However, there is a limit to the transplant of human organs. Attempts to transplant all organs, from the skin of your face to the brain, would lead to the destruction of human dignity and identity. We do not know everything about life. Far from it, in this age of advanced science, we cannot create even the lowest form of organism—amoeba. We can only replace a few parts of the body."

NOBUO is steadily recuperating from the taxing surgery. At 7:55 p.m. on August 14, or six days and 14 hours after the operation, he nodded, opened his eyes wide and smiled in response to questions asked by his savior. On the following day, he drank water out of a glass and ate liquid food, both without help. On the morning of August 19, for the first time after the operation, he brushed his teeth and sat on a chair for breakfast. On September 6, he took a walk on the hospital roof in a wheelchair. And on September 10, he had regained sufficient strength to walk unaided. In Nobuo's chest, he hears the regular heartbeat from Yoshimasa's legacy.



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